

# THE IRON AGE

A Review of the Hardware and Metal Trades.

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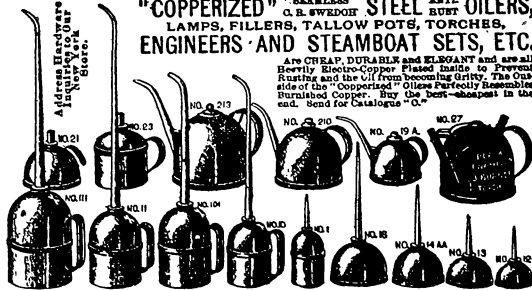
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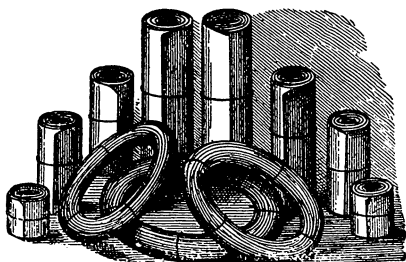
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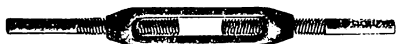
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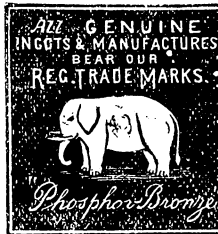
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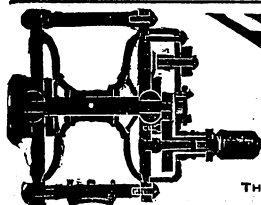
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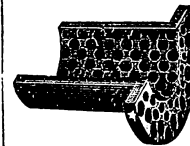
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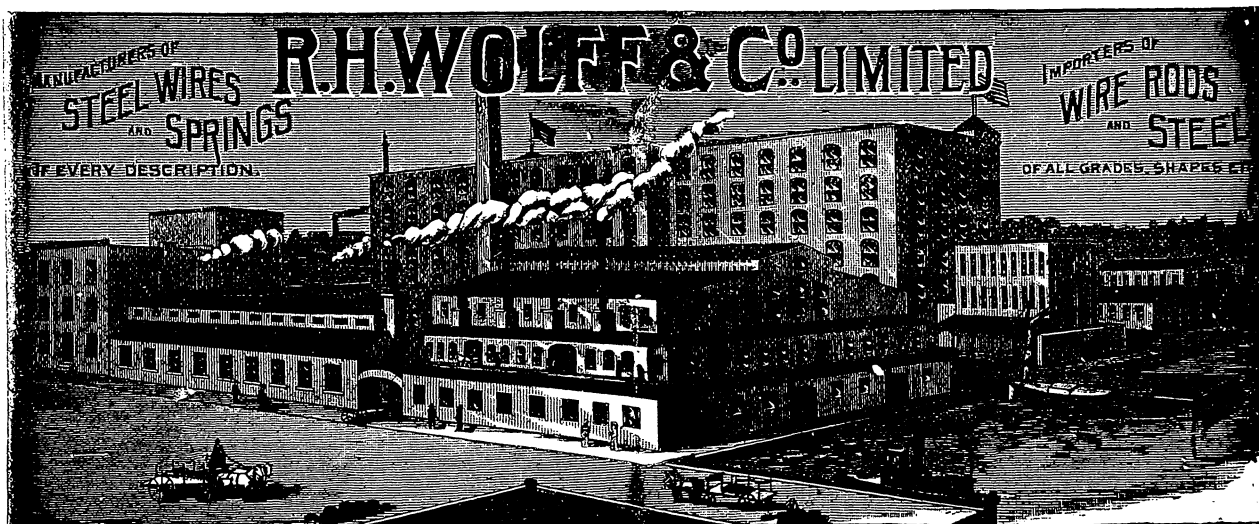
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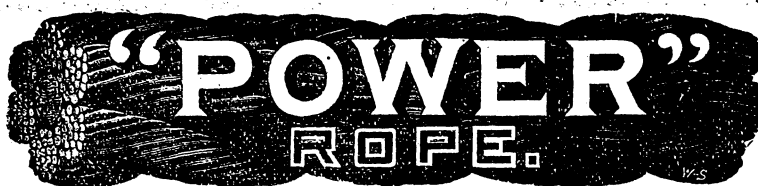
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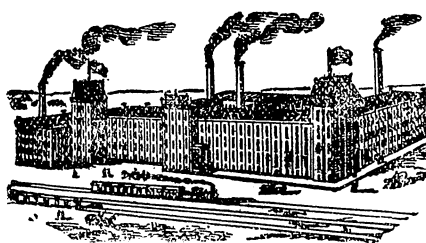
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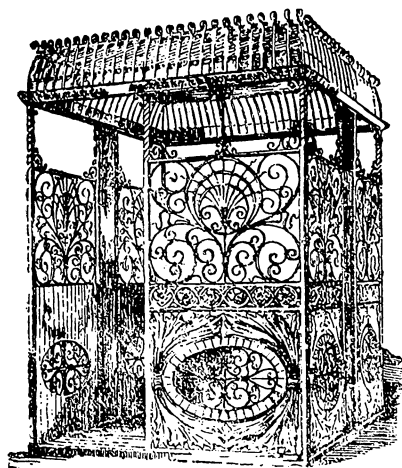
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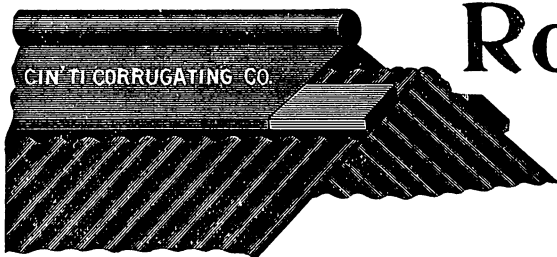
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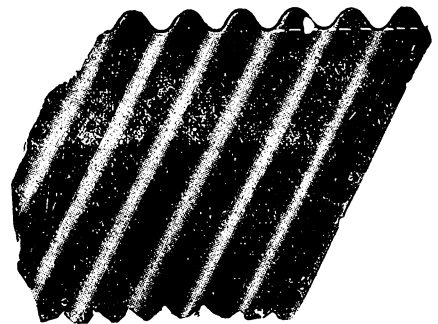
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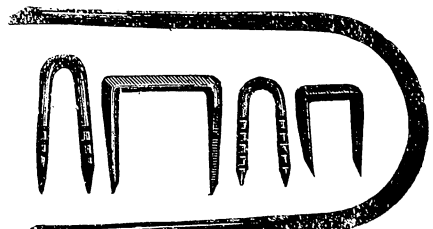
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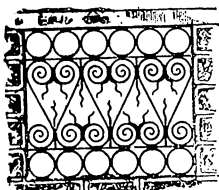
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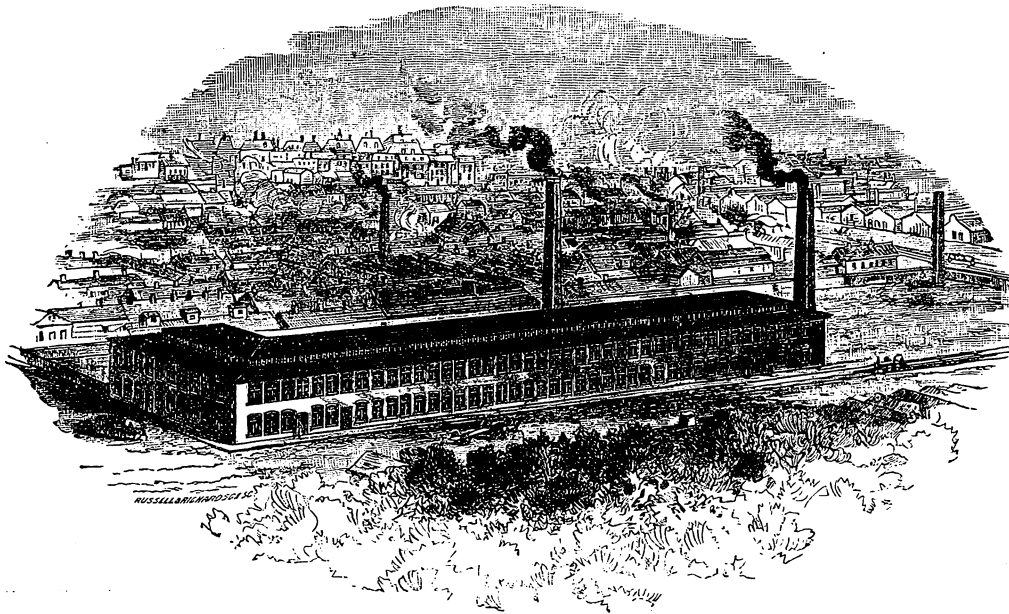
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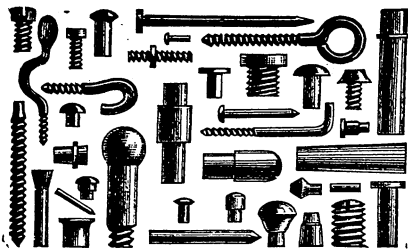
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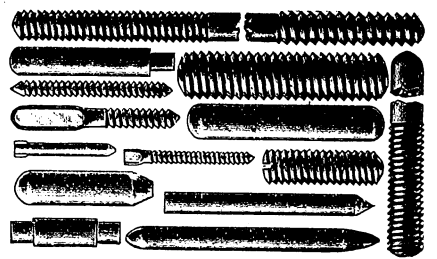
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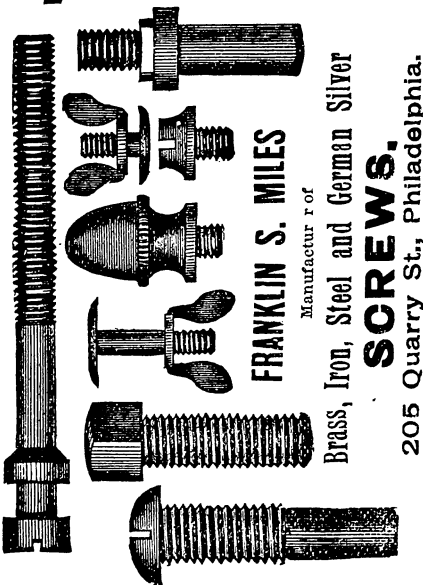
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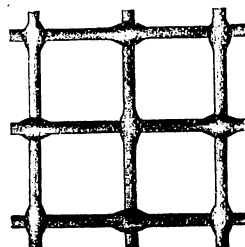
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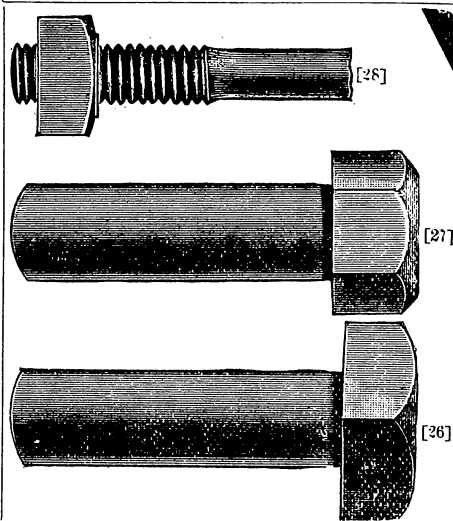
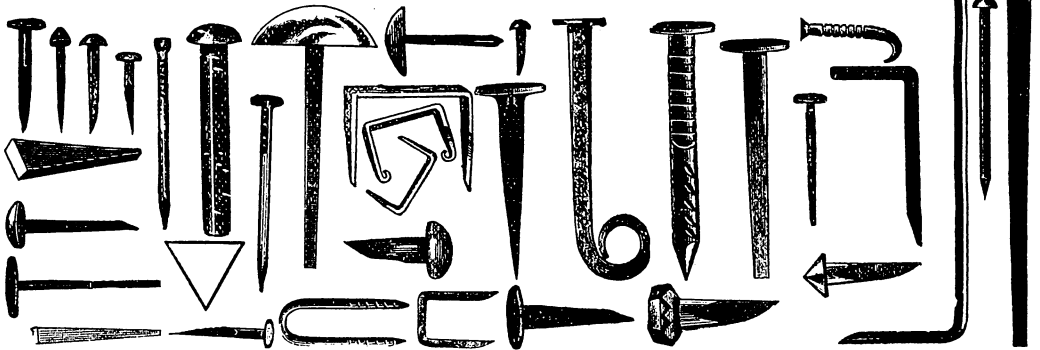
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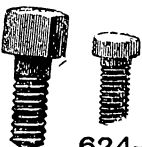
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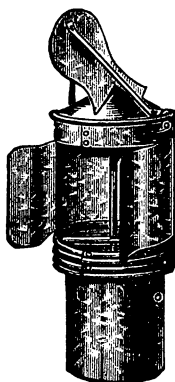
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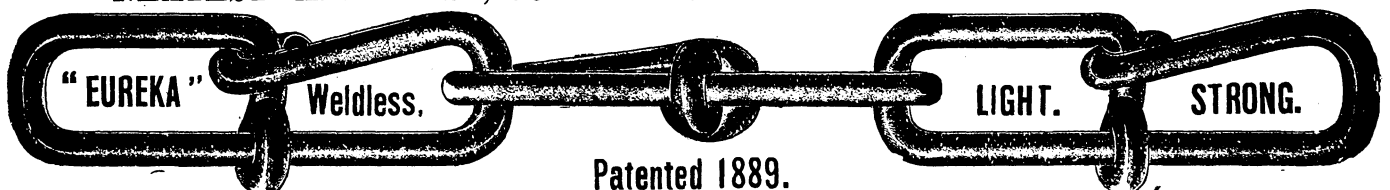
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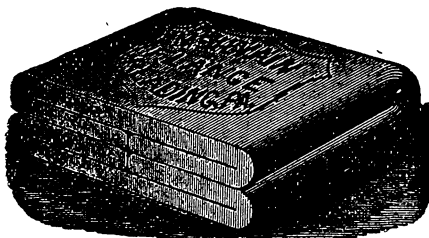
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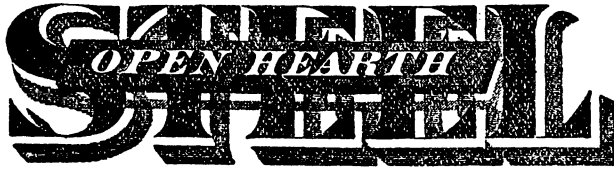
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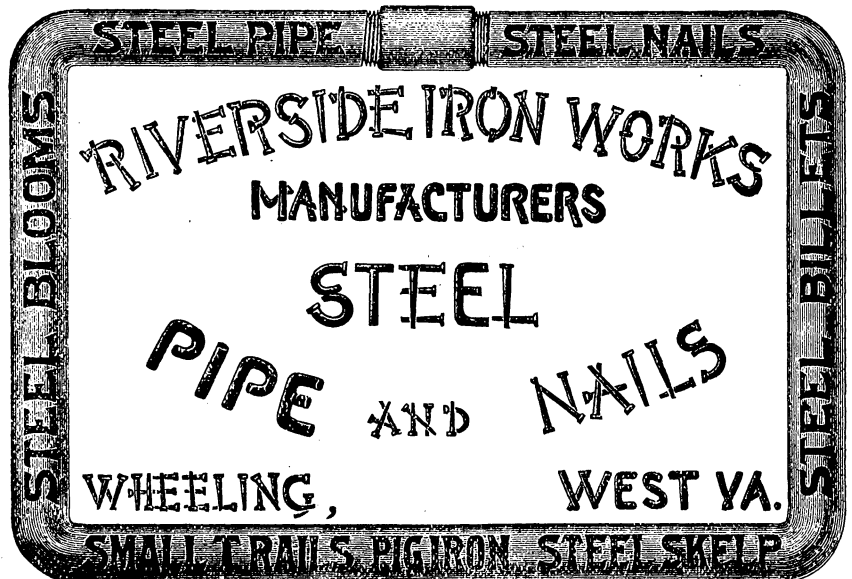
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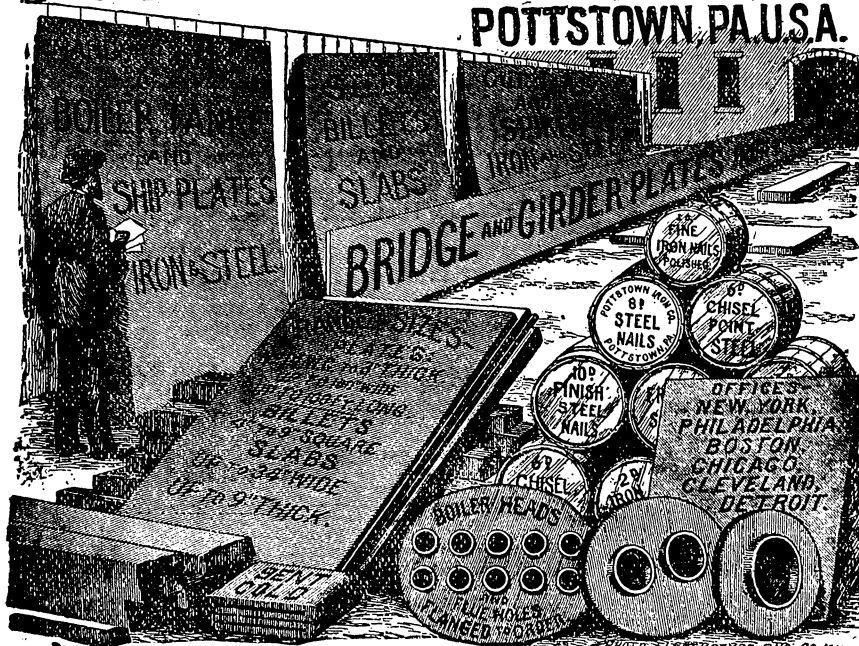
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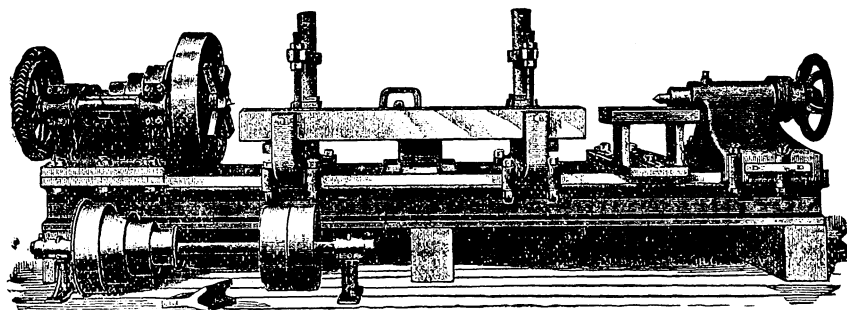
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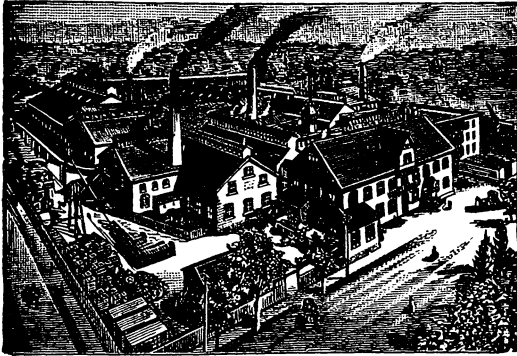
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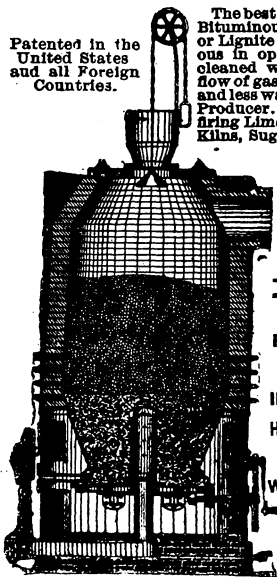
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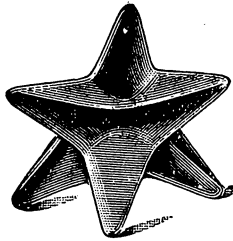
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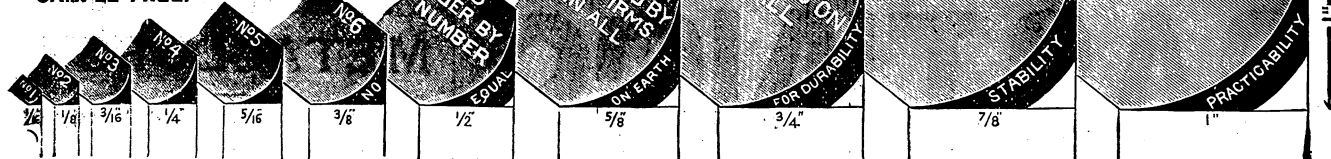
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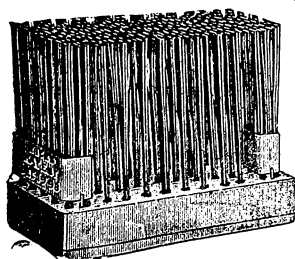
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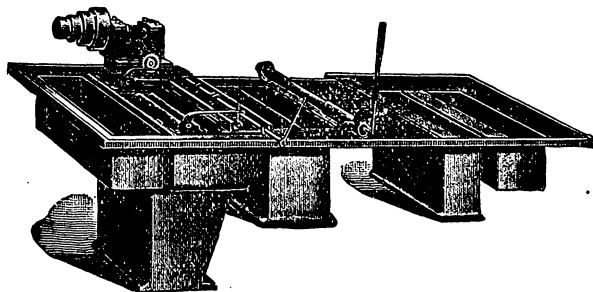
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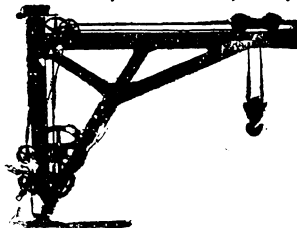
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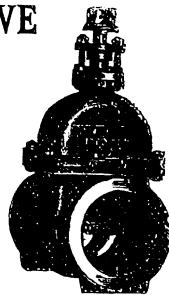
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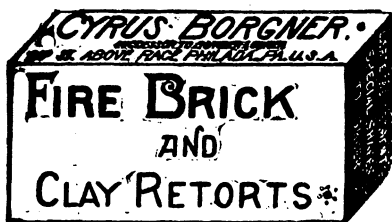
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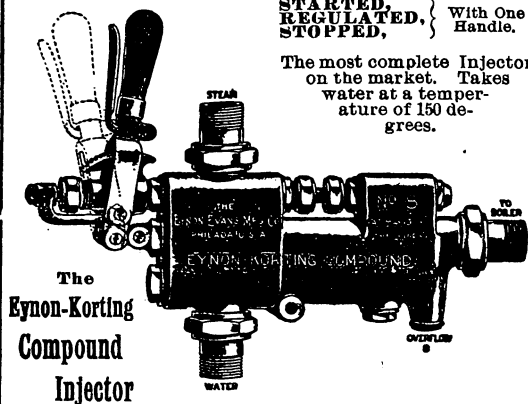
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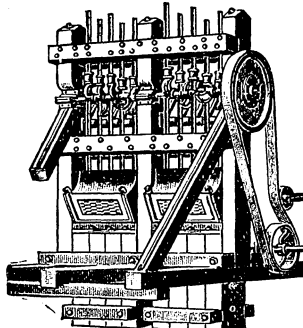


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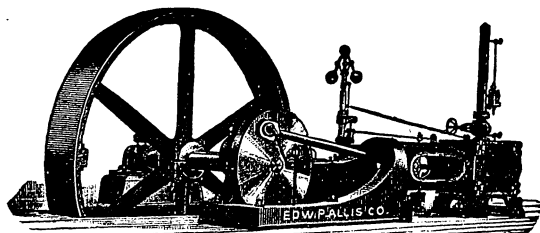
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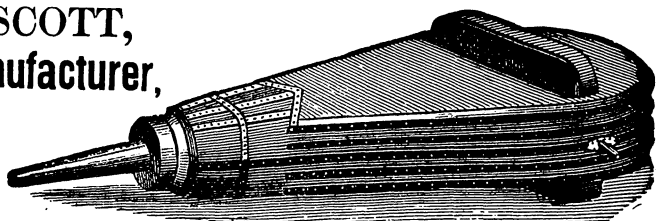
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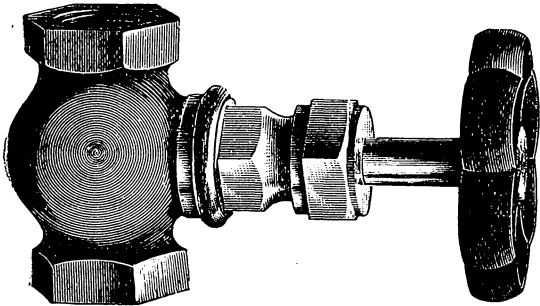




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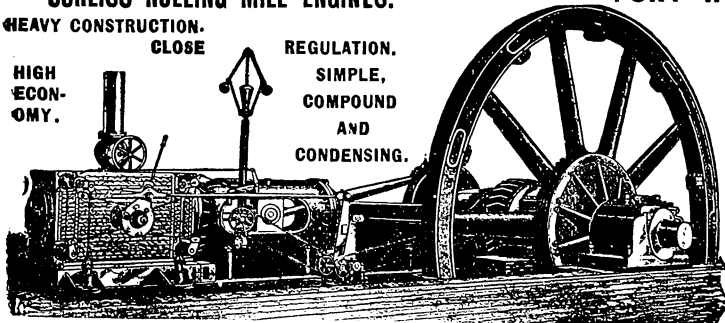
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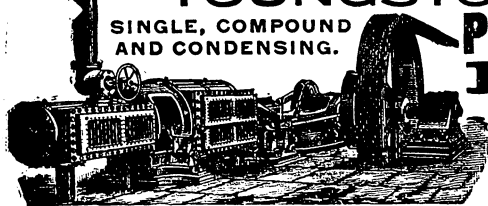
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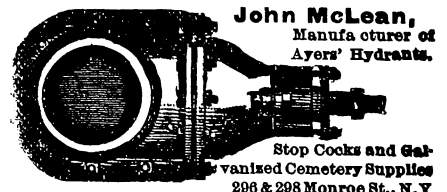
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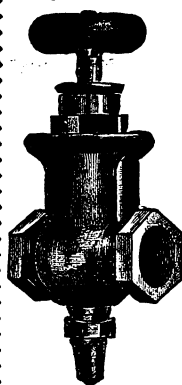
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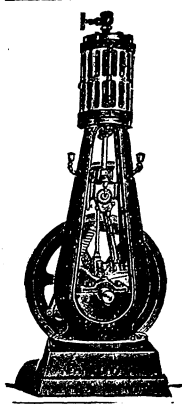
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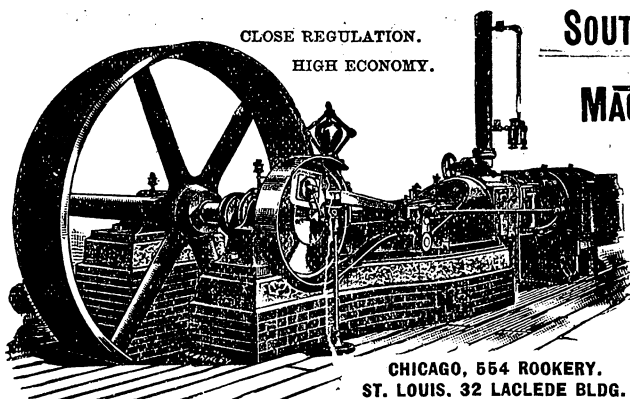
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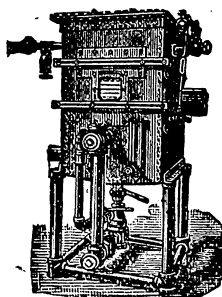
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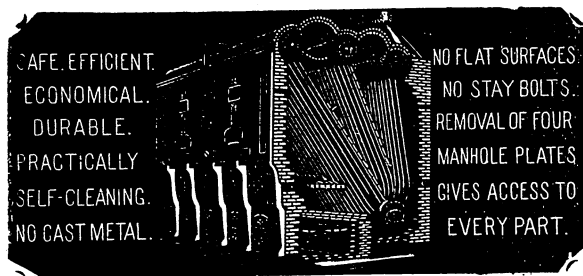
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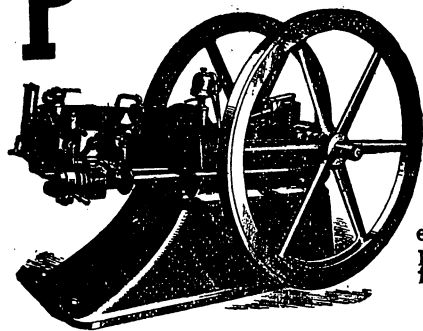


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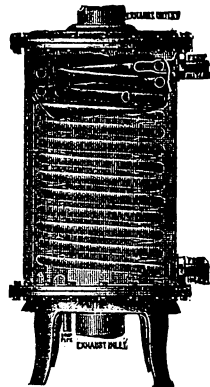
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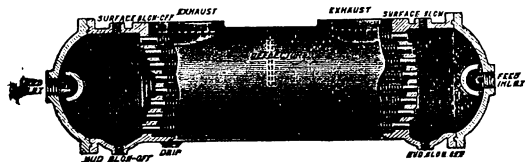
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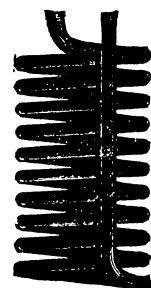
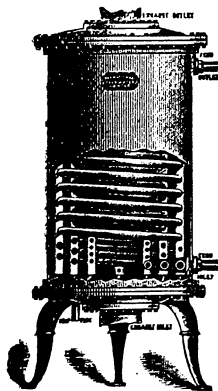
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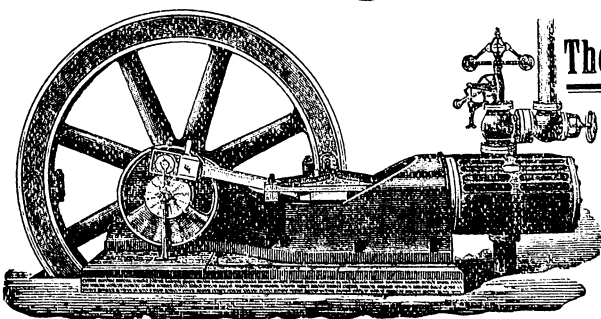
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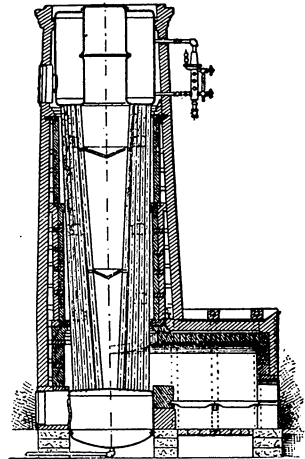
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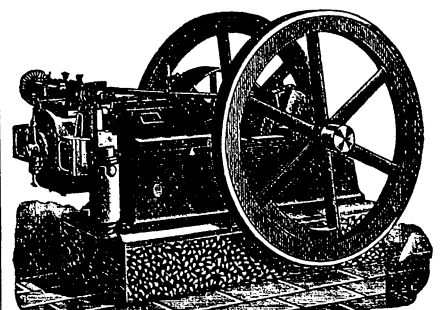
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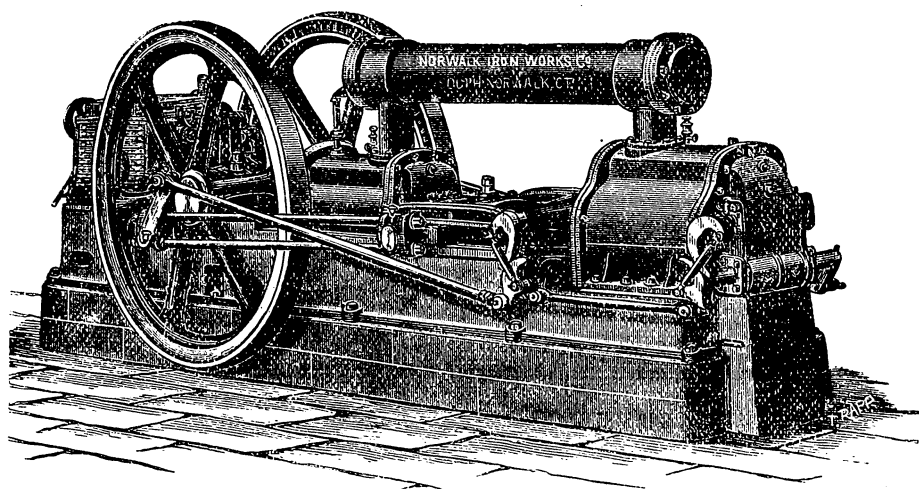


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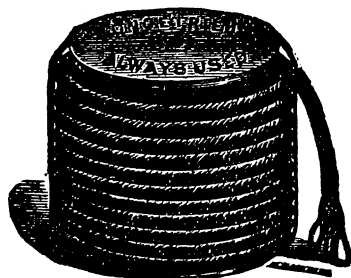
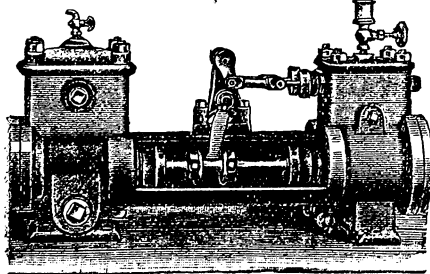
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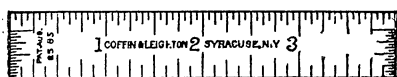
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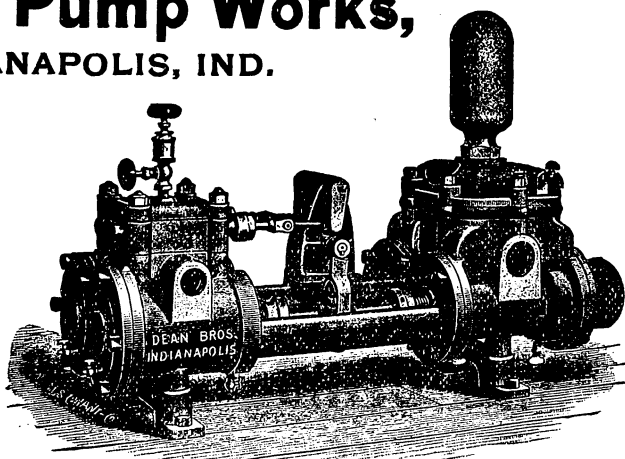
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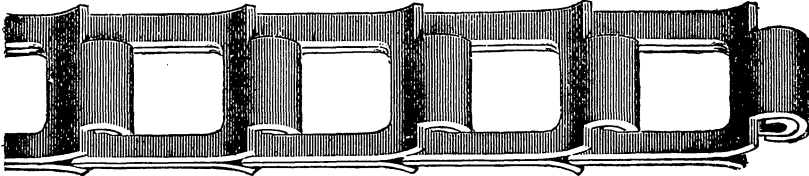
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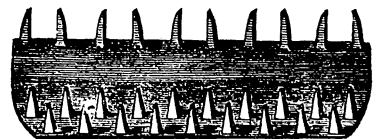
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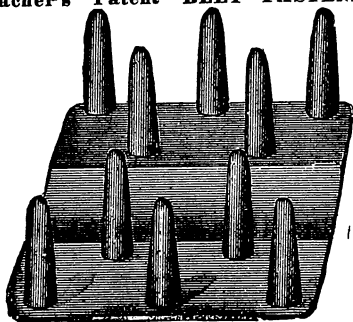
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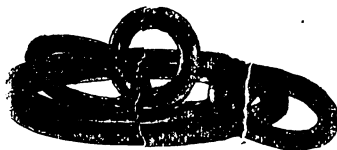
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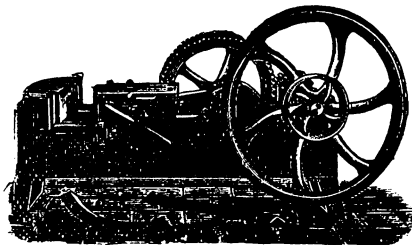
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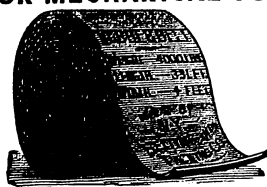
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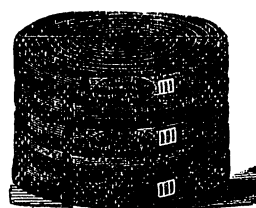


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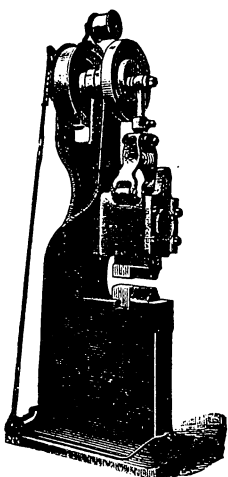
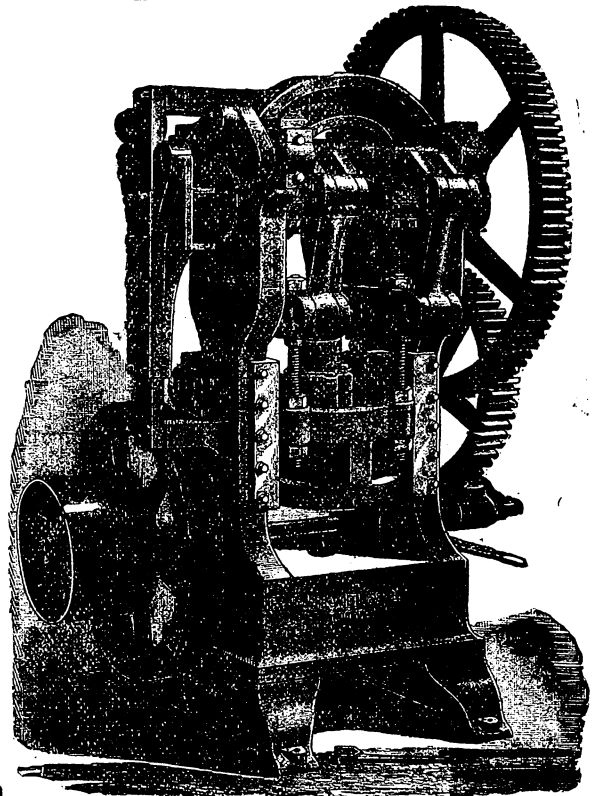
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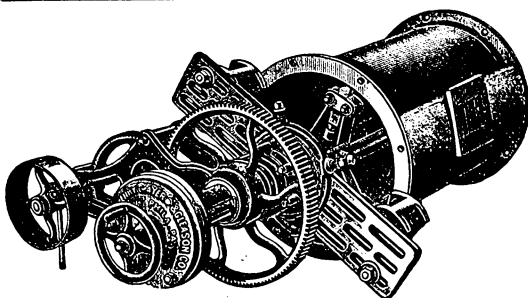


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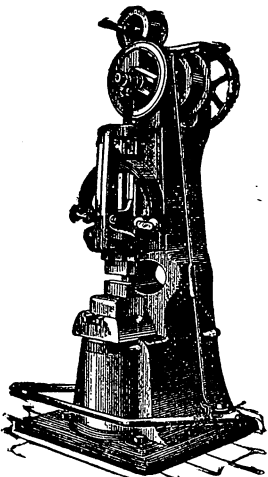
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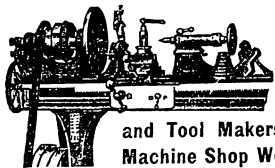
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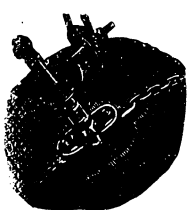
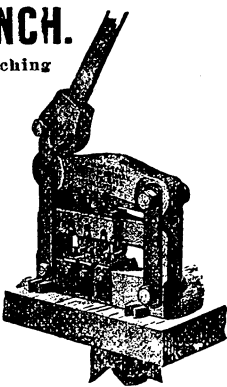
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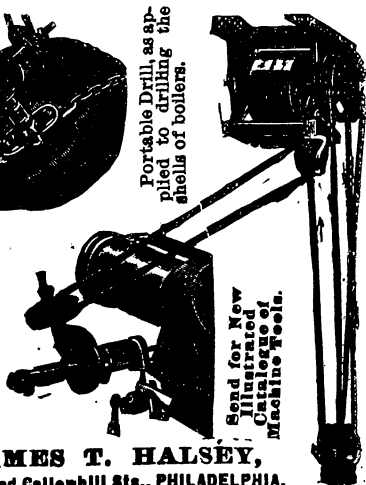
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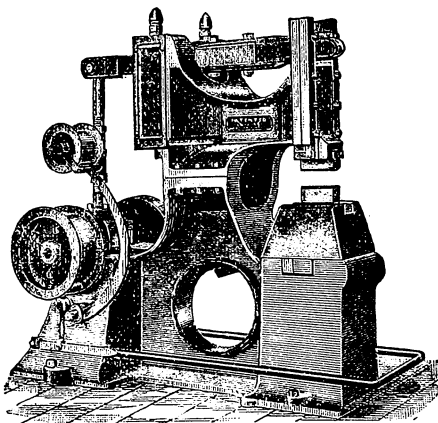
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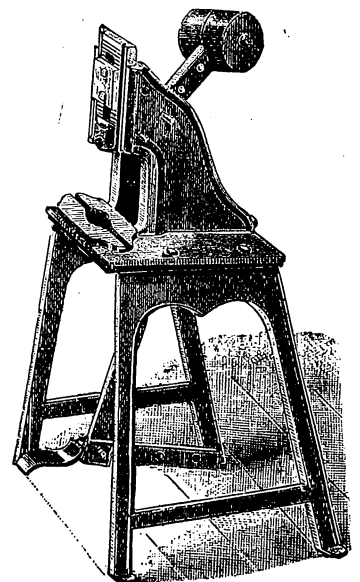
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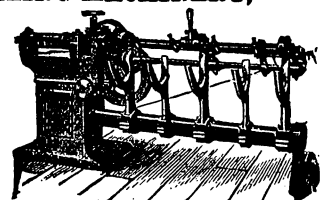
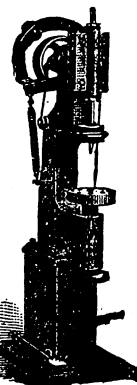
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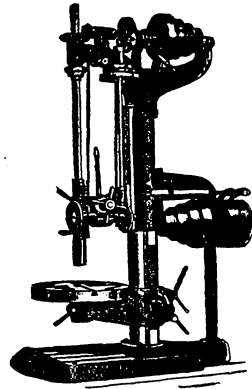
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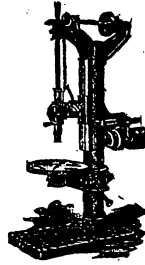


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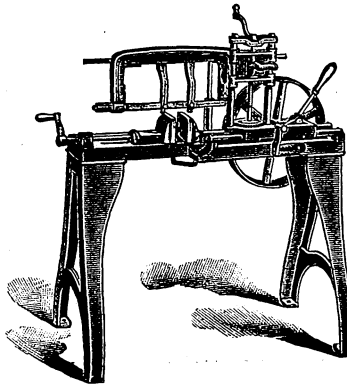


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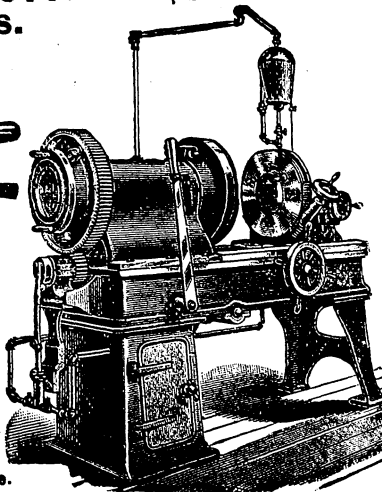
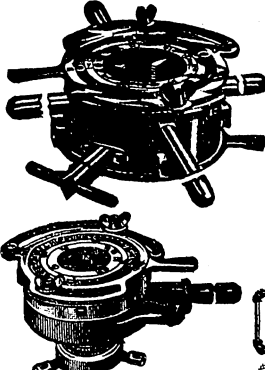
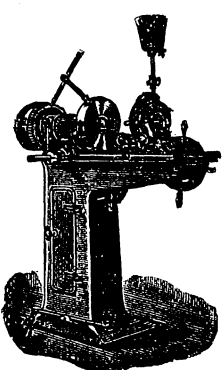
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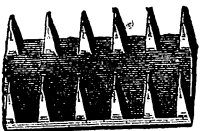
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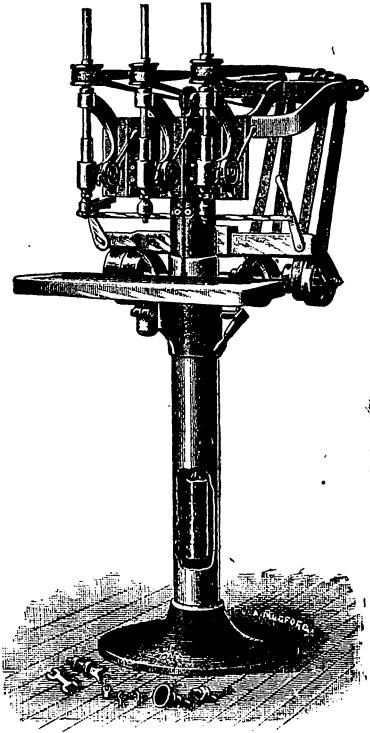
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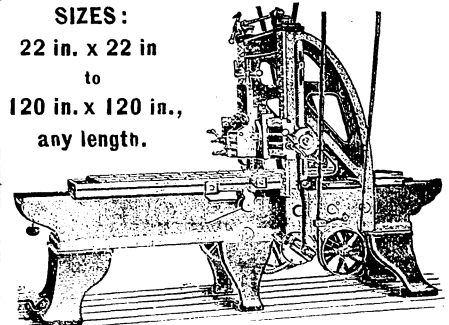
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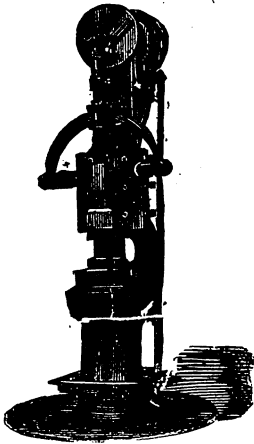
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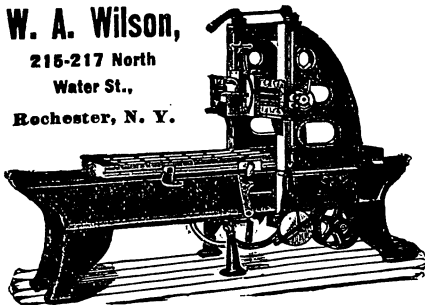
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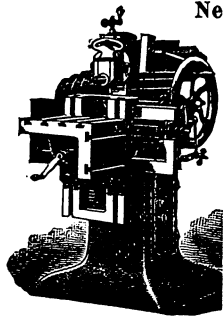
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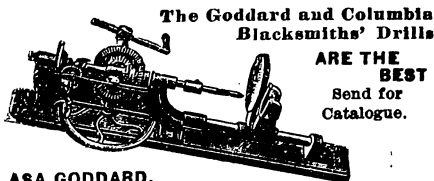
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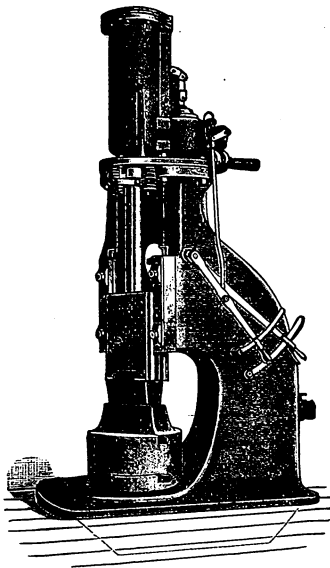
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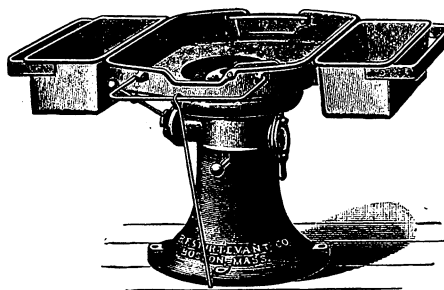
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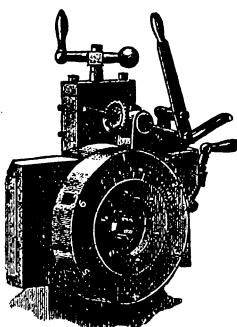
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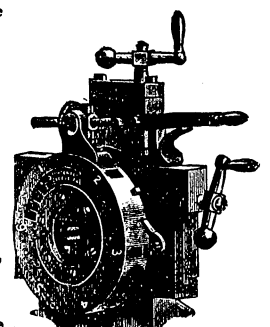
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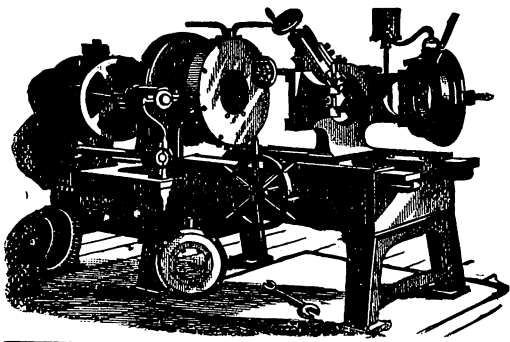
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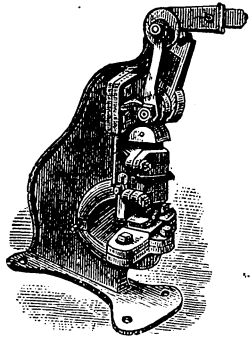
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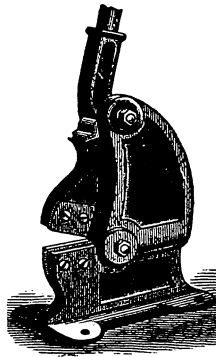


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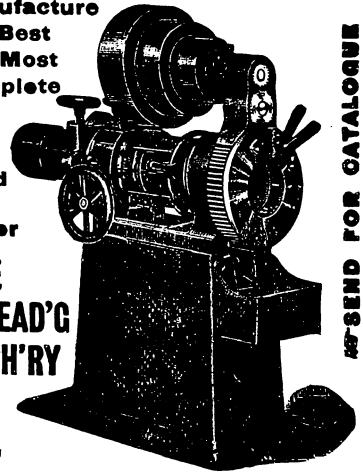


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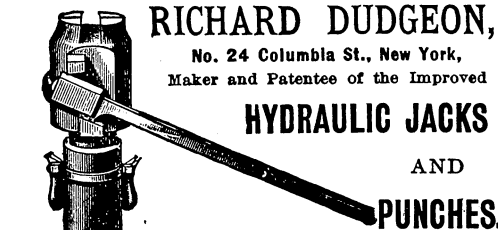
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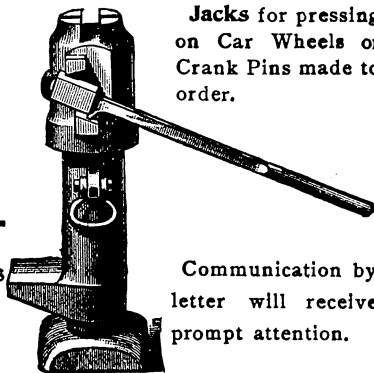
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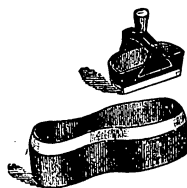
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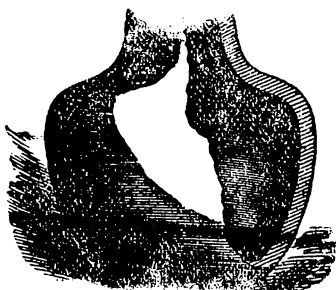
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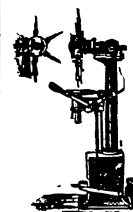
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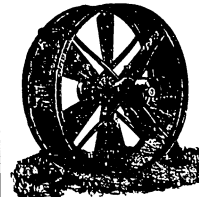
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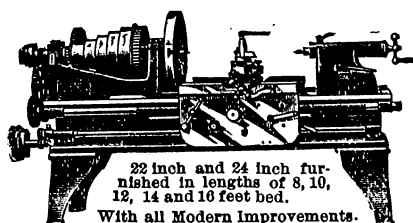
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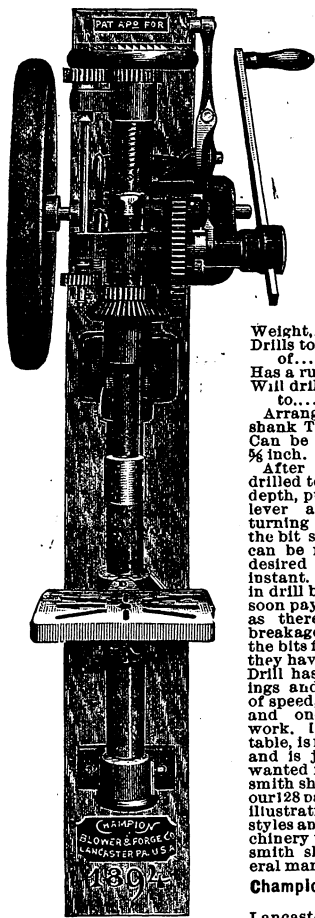
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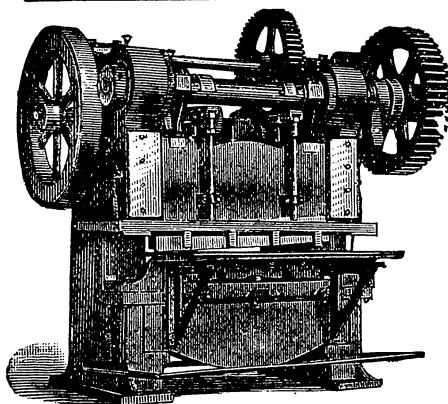
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Has a run of..... 1/4 in.  
Will drill holes up  
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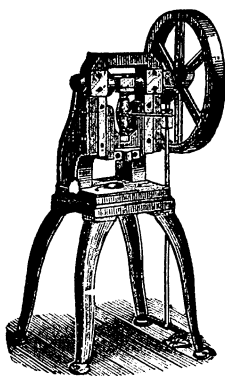


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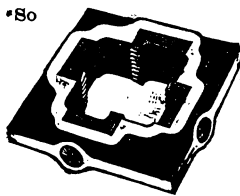
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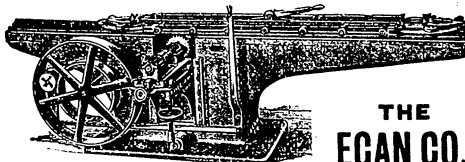
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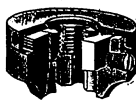
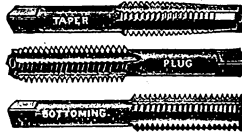
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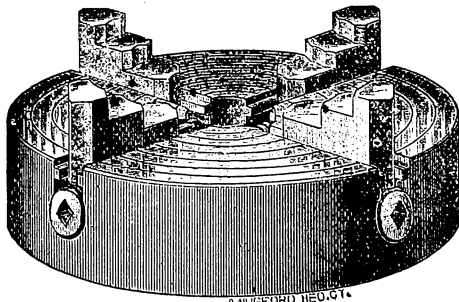
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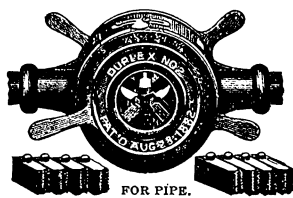
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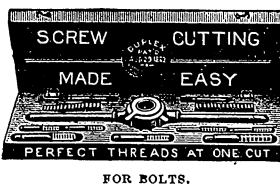
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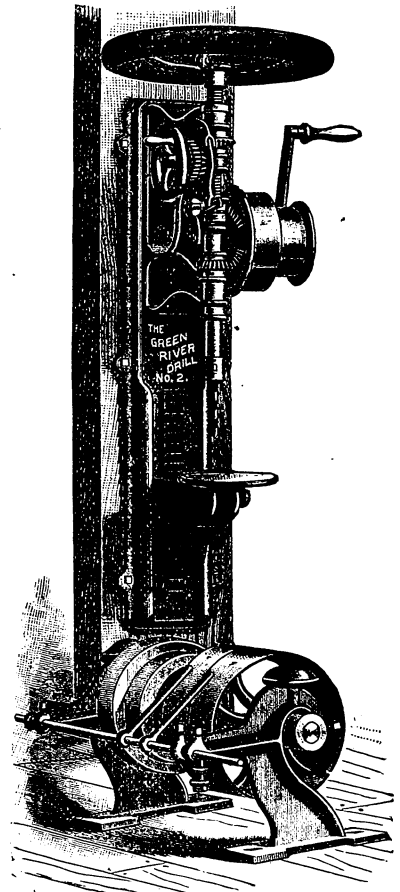
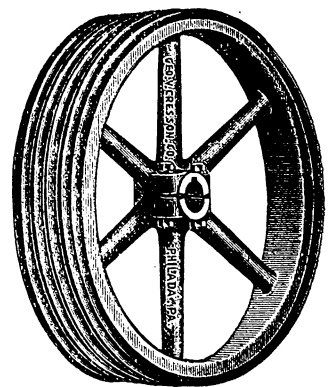
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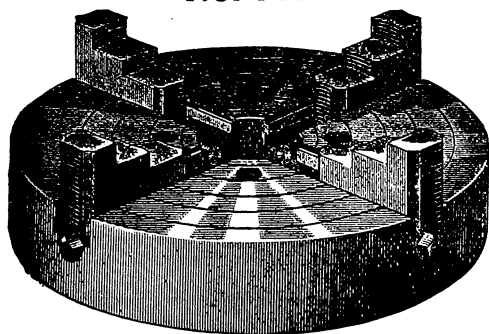
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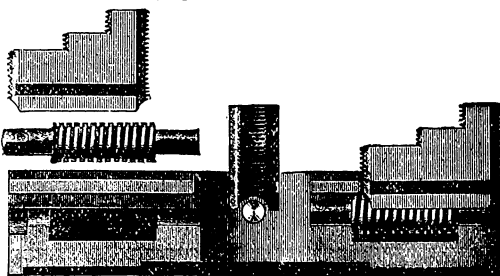
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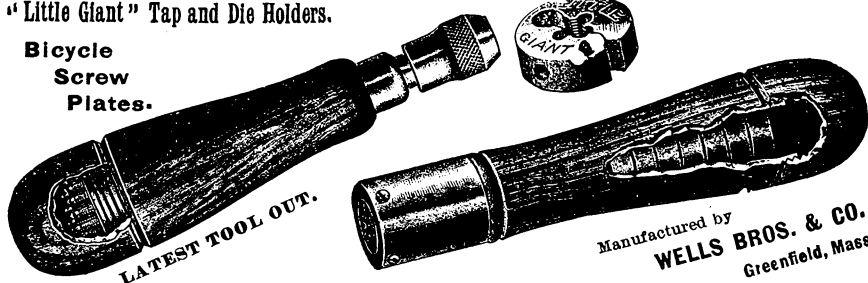
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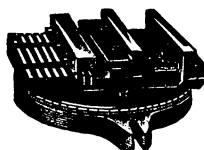
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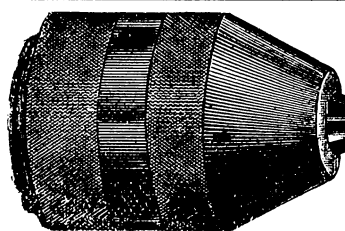


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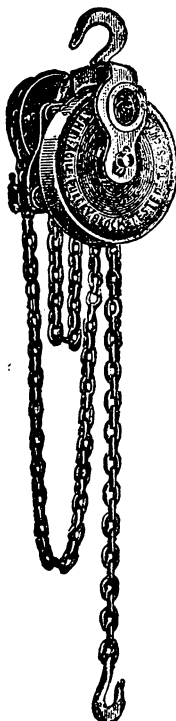
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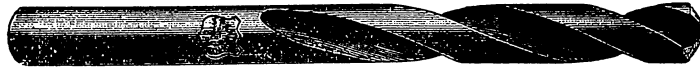
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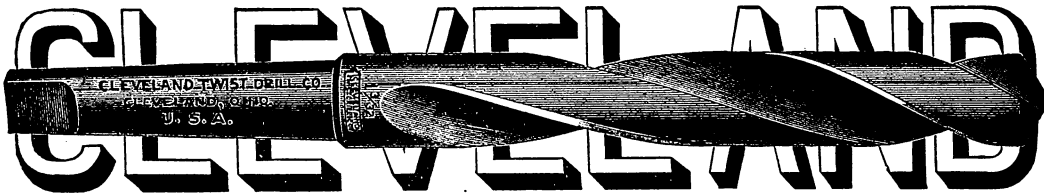
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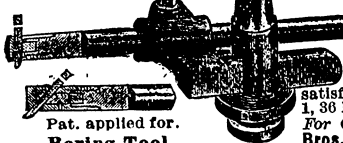
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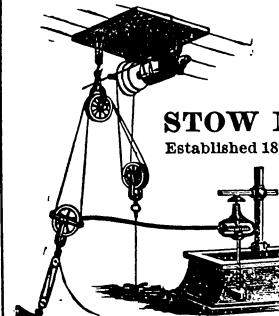
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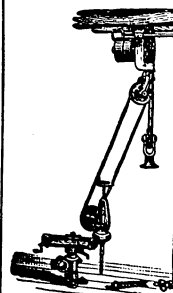
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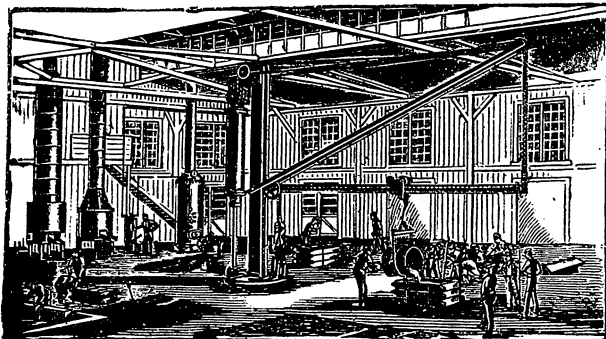
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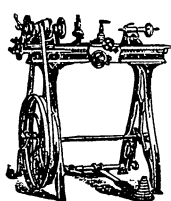
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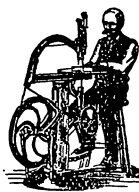
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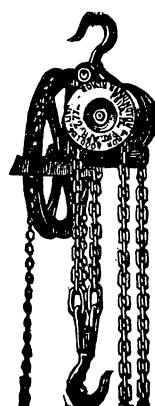
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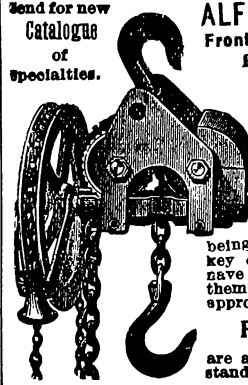
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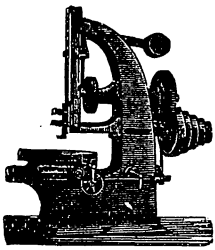
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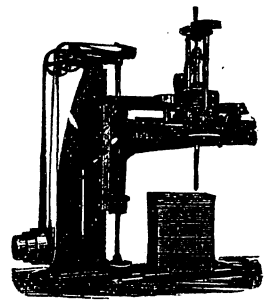
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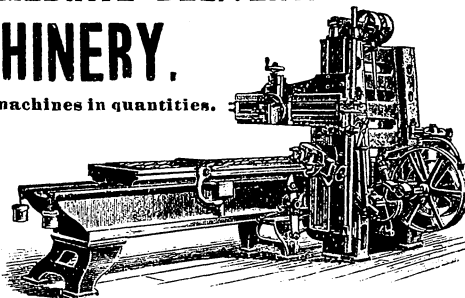
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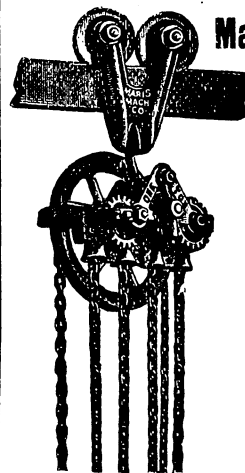
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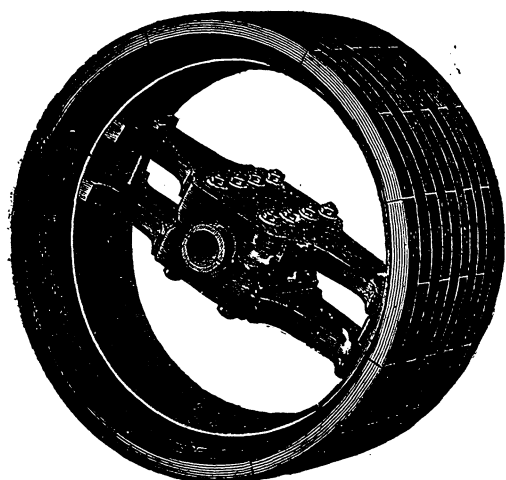
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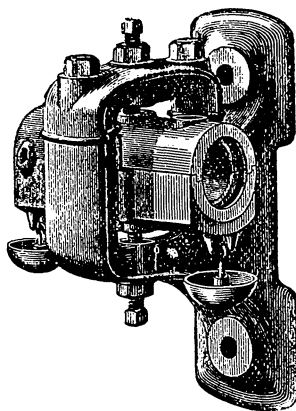
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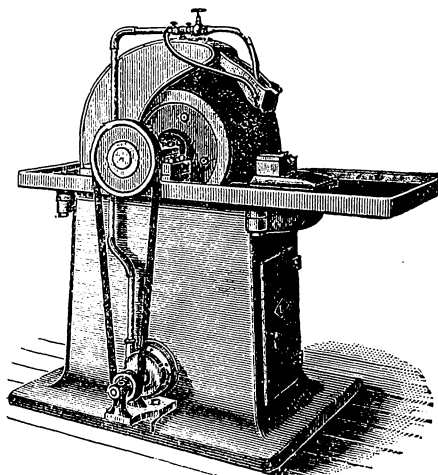
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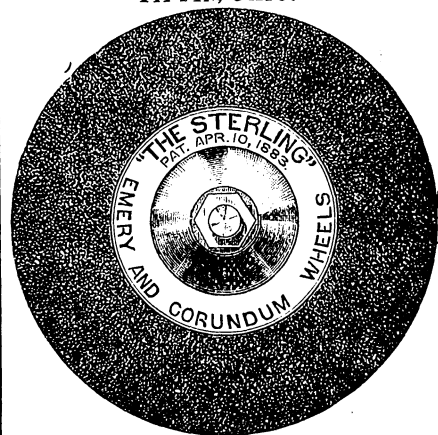


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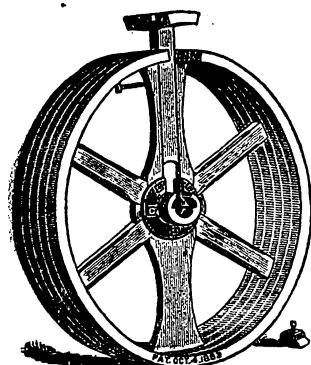


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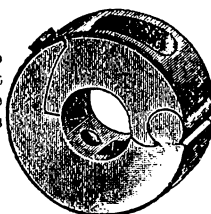
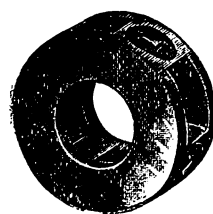
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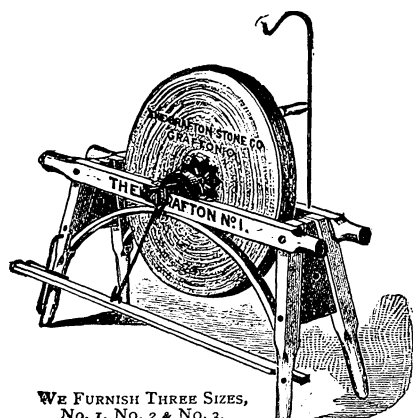
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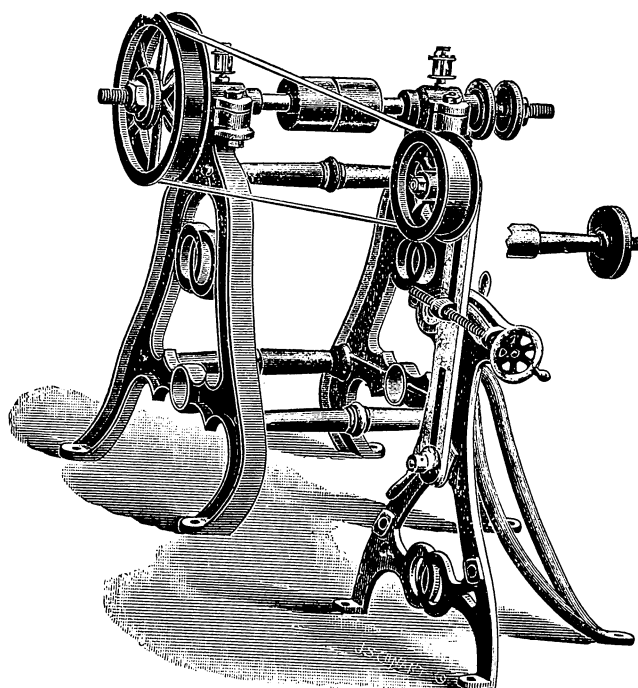


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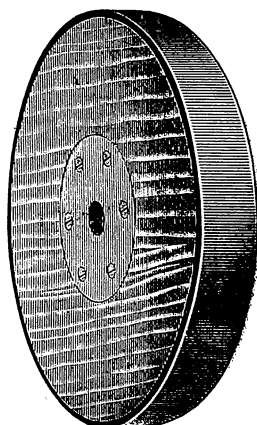
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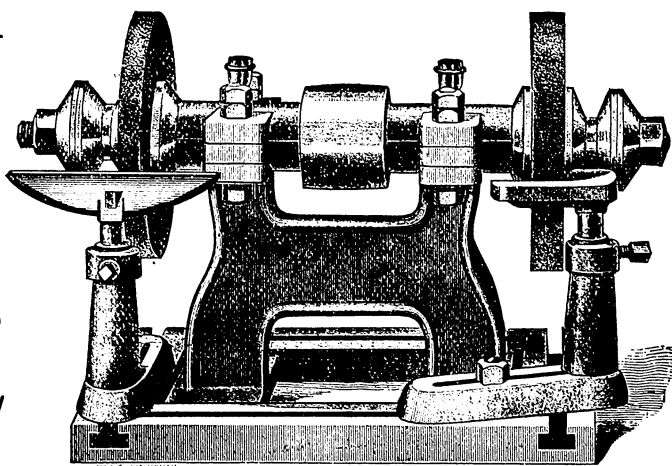
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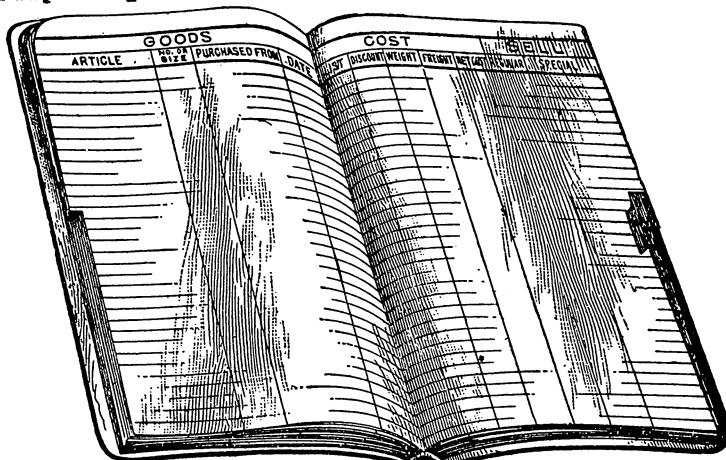
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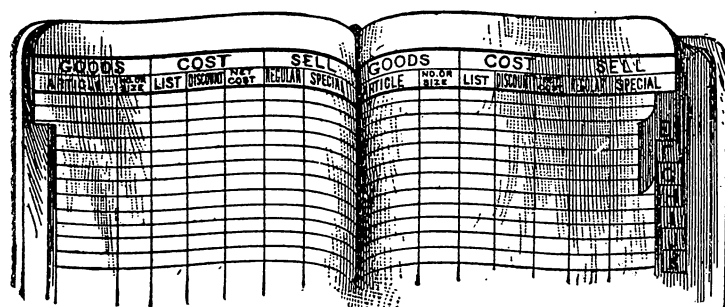
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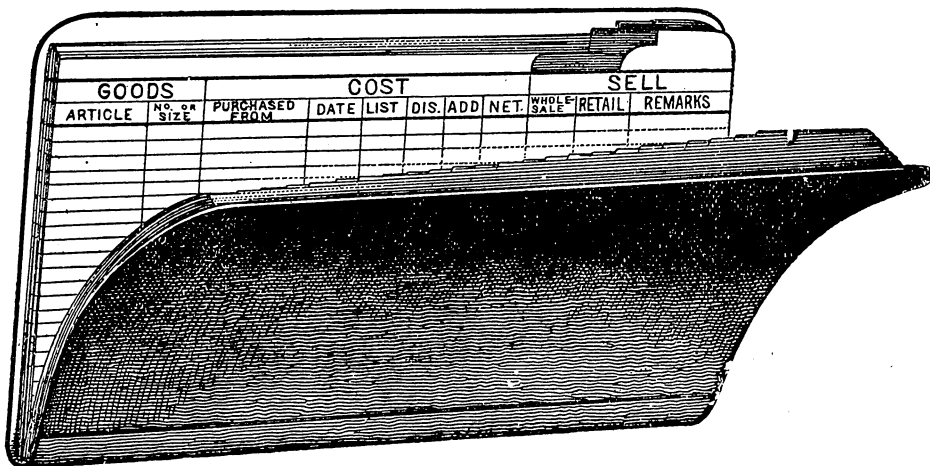
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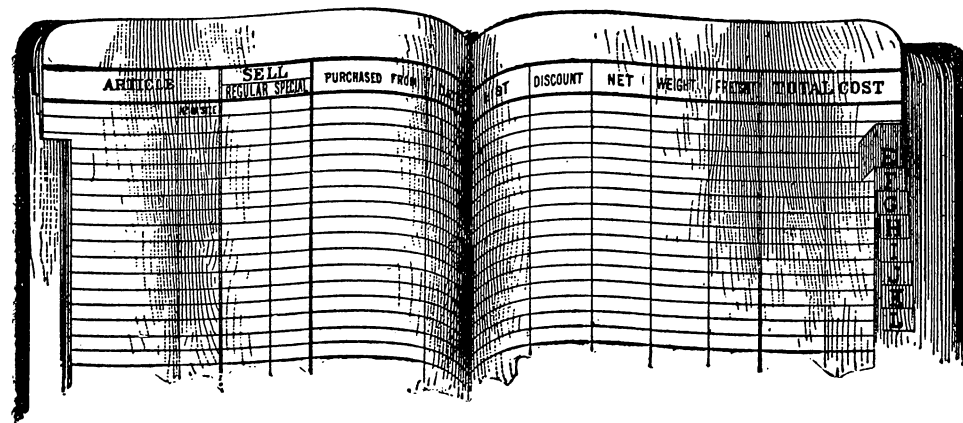
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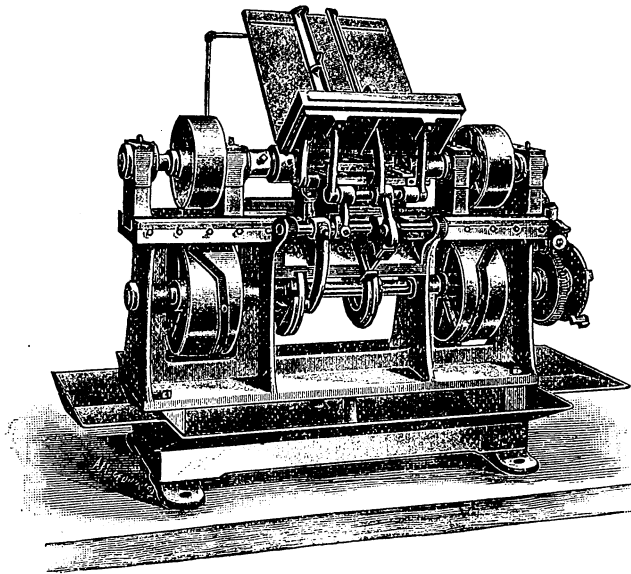
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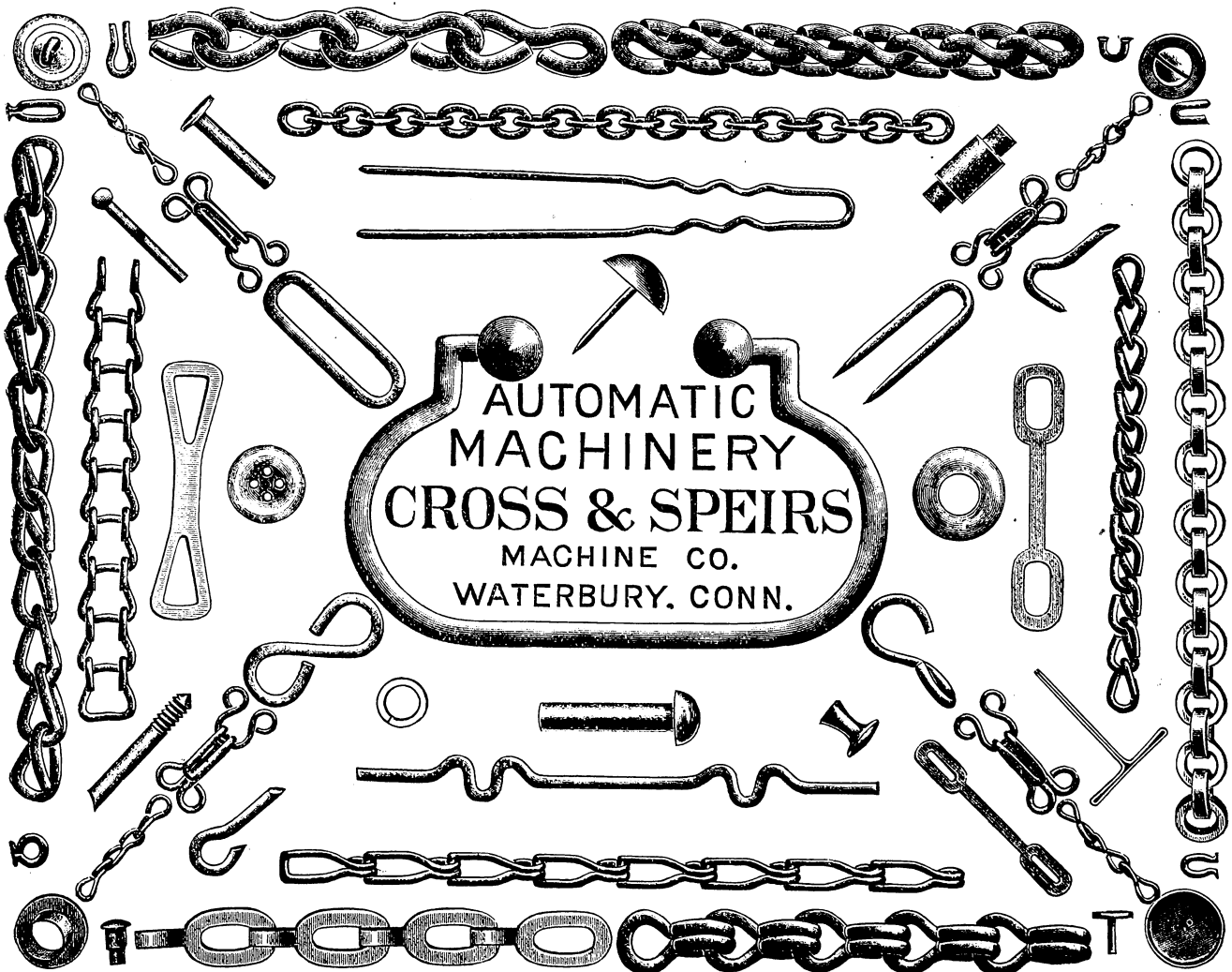
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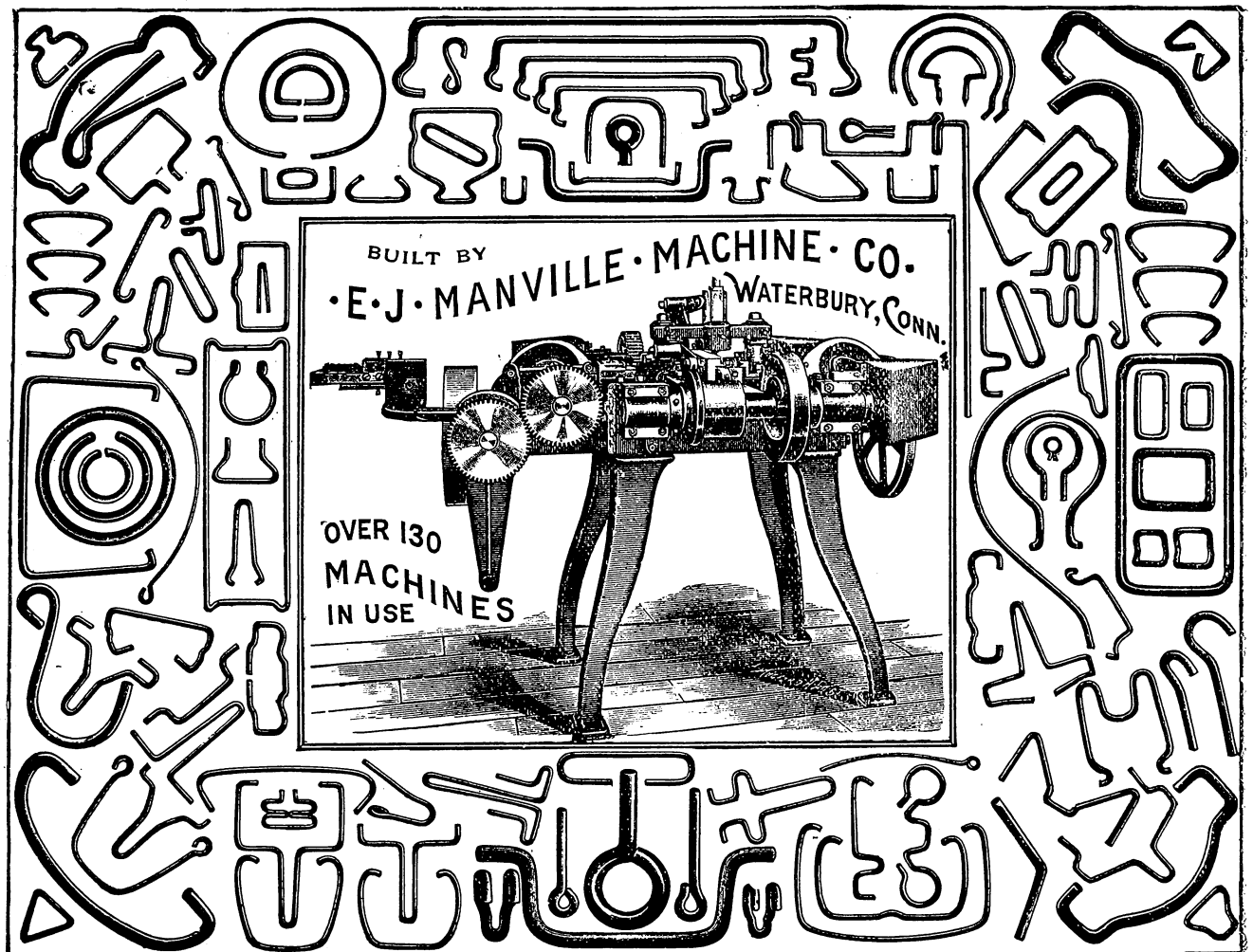


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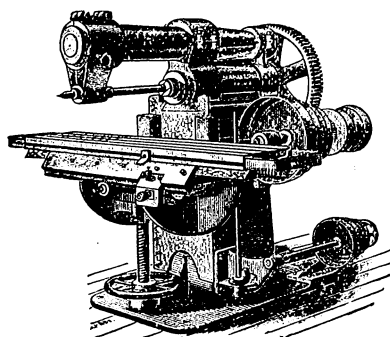
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1 37 in. x 17 ft. Screw Cutting Engine Lathe.  
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1 18 in. x 7 ft. Screw Cutting Engine Lathe.  
1 19 in. x 9 ft. Screw Cutting Engine Lathe.  
1 27 in. x 10 ft. Gould & Eberhardt Lathe.  
1 16 in. x 6 ft. Field Lathe.  
1 16 in. x 8 ft. Field Lathe.  
1 26 in. x 13 ft. Grant & Bogart Lathe.  
1 18 in. x 8 ft. New Haven Lathe. Screw cutting.  
1 30 in. x 12 ft. Lathe for cutting off iron.  
1 16 in. x 8 ft. Turret Machine.  
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1 16 in. x 6 ft. Brown & Sharpe Turret Machine.  
1 Michaels Lever Drill with Countershaft.  
3 Michaels Lever Drills.  
1 26 in. Bickford Drill, B. G., P. F. Quick return.  
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1 80 in. Upright Drill.  
1 29 in. Pond Drill, B. G. Self feed.  
1 16 in. Boynton & Plummer Post Drill.  
1 20 in. Pond Drill. Hand feed.  
1 30 in. Prentice Drill, B. G., S. F. Quick return.  
1 24 in. Pond Drill, B. G., S. F. Quick return.  
1 21 in. Key Saw Table, 5 in. stroke. Hand feed.  
1 Brown & Sharpe Emery Grinder with countershaft.  
1 Brown & Sharpe Universal Milling Machine.  
1 20 in. Hendy Shaper.  
1 Tool Grinder with countershaft.  
1 Garvin Tool Grinder. Cutter grinder attached.  
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Used but a few weeks.

Kerkhoff make.

Back geared; Power feed. Height, 8 ft. 2 in. Diam. Column, 9 in. Weight, 2600 lbs.

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One David Pond Iron Planer, 32 in. x 32 in. x 10 ft. Double Head.  
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One W. P. Davis Iron Planer, 24 in. x 24 in. x 6 ft.  
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One Bement Planer, 20 in. x 20 in. x 6 ft.  
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One 8 1/2 in. x 10 in. Arrington & Sims Automatic Horizontal Engine.  
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3 Steam Shovels.  
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Engines and Boilers.

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9 in. x 8 ft. Young Foot Power.  
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16 in. x 16 in. x 12 in. Belden. (Crank).  
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6 in. Crank. Boynton & Plummer.  
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21 in. x 11 ft. Lodge & Davis.  
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12 in. & 15 in., Lever and screw movement to turret.  
18 in. Turret Chucking.  
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**DRILL PRESSES.**  
20 in. Lever Drill.  
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52 in. Comb. Radial.  
120 in. Radial.  
Hendley Swing Drill.

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2 No. 1 Garvin Tapping Machines.  
1 No. 2 Garvin Tapping Machine.  
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New Improved Engine Turret.  
Turret, Brass Working and Pulley Machinery.

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28 " 5 and 8 " "  
30 " 5, 8 and 10 " "  
60 " 20 " "  
72 " 25 " "  
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Crane, Both A.I. Punch and Shear.  
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Lot of Miscellaneous Machinery, Engines, etc. Send for Latest List.

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## Special lot of NEW ENGINE LATHES

18 in. x 5 ft. 17 in. x any length bed.  
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## Machine Tools, Special Prices;

Planer 29' x 27' x Planes 7'. Good.....\$325.  
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16 in. x 8 ft. Engine Lathe. Good order.  
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16 in., 20 in., 22 in. and 26 in. Shapers.

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**Punches and Shears.**

1 26 in. Power Shear, with engine. Also a number of Punch and Shearing Machines, Small Rolls, etc. Write for prices. Address:  
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- 1 13 x 6 Pratt & Whitney Lathe.
- 1 14 x 5 Wheeler Lathe.
- 1 16 x 6 Bogart Lathe.
- 1 18 x 8 New Haven Lathe.
- 1 17 x 12 Engine Lathe.
- 1 18 x 6 Putnam Lathe.
- 1 18 x 8 New Haven Lathe.
- 1 20 x 10 Porter Lathe.
- 1 20 x 11 New Haven Lathe.
- 1 28 x 14 Blaisdell Lathe.
- 1 30 x 20 Putnam Lathe.
- 1 30 x 23 Sellers Lathe.
- 1 36 x 18 Perkins Lathe.

### PLANERS.

- 1 24 x 24 x 7 New Haven Planer.
- 1 24 x 24 x 8 Lodge & Davis Planer.
- 1 30 x 30 x 8 Pease Planer.
- 1 36 x 30 x 8 Hollingshead Planer.
- 1 36 x 36 x 8 Cove Planer.
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- 1 15 in. Gould & Eberhardt Shaper.
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- 1 18 x 6 Automatic Turret Lathe.
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- 1 Engine Lathe 60 in. x 18 ft. New. Bargain.
- 1 Engine Lathe 24 ft. bed, 64 in. swing, D. W. Pond make, A1.
- 1 Engine Lathe 48 in. x 18 ft., raised to 60 in., Putnam make.
- 1 Engine Lathe 34 in. x 8 ft. 1 30 in. x 14 ft., Putnam.
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- 1 14 in. x 32 in. Watts & Campbell Engine.
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ENGINES, Horizontal and Vertical. All types and sizes up to 2,000 H. P.  
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Planers, Drills and Lathes, good as new, for cash.

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- 2 16 in. Muck Trains.
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- And many other requisites.

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CORLISS ENGINES, 36 in. dia. and under.  
PUMPS of all kinds and sizes.  
DYNAMOS, 50 to 500 light capacity.  
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ICE MACHINES, 2 of 15 tons each.  
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Write for what you need to  
MARVIN BRIGGS, 12 Broadway, N. Y.

DOUBLE CORLISS CONDENSING ENGINE, 600 H. P., One 15 inch by 42 inch Corliss Engine, 125 H. P. Double Automatic Engine, 350 H. P., two 100 H. P. Phoenix Automatic Compound Engines 45 and 5 H. P., Westinghouse Engine, one 80 H. P. Beck Engine, one 7 x 7 Southwark Automatic Engine, one 4 H. P. Otto Gas Engine, 100, 200, 300 and 600 H. P. Feed Water Heaters, 30 to 100 H. P. Return Tubulars, 70 H. P. Locomotives, 60 H. P. Vertical Boilers, good for 100 pounds.  
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1 Hendey Shaper, 15 in. stroke, imp. vise.  
1 14 x 6 Screw Cutting Engine Lathe. New.  
Pattern Makers' Speed Lathe, 7 ft. bed, \$40. New.  
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44 in. C. & D. Resaw. Fine condition.  
Radial Drill, 5½ ft. arm.  
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## A LARGE ADDITION TO OUR STOCK OF CORLISS ENGINES.

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- 18 in. x 8 ft. Blaisdell.
- 18 in. x 8 ft. Wamesit.
- 18 in. x 10 ft. Blaisdell.
- 18 in. x 9 ft. D. W. Pond.
- 20 in. x 6 ft. Bullard.
- 24 in. x 12 ft. Geo. Gage.
- 26 in. x 9 ft. Lathe & Morre.
- 26 in. x 12 ft. Field.

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- 22 in. x 22 in. x 4 ft. L. W. Pond.
- 22 in. x 22 in. x 6 ft. Pond Machine Tool Co.
- 24 in. x 24 in. x 5 ft. Putnam.

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- 10 in. Pratt & Whitney.
- 10 in. Juengst Crank.
- 15 in. Juengst Friction.
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- 18 in. Putnam Traverser Head.
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- No. 1 Garvin Universal.
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Also a large number of other machines. Write for a complete list and detailed description.

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Baker Blowers, Nos. 3, 4, 5, 5½, and 7½.  
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Worthington Duplex Pump, Compound, 25 in. x 43 3-10 in. x 6½ in. x 36 in., equal new.  
D. W. Pond Planer, 26 in. x 26 in. x 8 ft., equal new.  
Niles Boring and Turning Mill, 37 in., equal new.  
9 Hewes & Phillips Lathes, 12 in. to 21 in.  
Numerous Engines, Boilers, Pumps, Tanks, Crushers, Compressors, Rock Drills, Hoisting Engines, &c., cheap.  
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Planer 28 in. x 24 in. x 7 ft. New.  
Drill Press, 40 in. swing. New.  
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Haskin Vertical Engine, 9 x 9. 2d hand.  
Improved 36 in. Band Saw. New.  
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Open-die Bolt Cutter ¼ to 1¼ in. 2d hand.  
Write us before buying. **COOKE & CO.,** Machinery and Supplies, 163 and 165 Washington St., New York.

### FOR SALE.

Two Double Deck Boilers, 40 H. P., Cheap Iron Tanks, Square, 4 x 4 x 6, 4 x 4 x 5 x 11. Cylinder Boilers and Flues from 8 in. to 36 in. diameter, for stacks and water. Two Radiators. 25 H. P. Engine and Boiler, Horizontal. 25 H. P. Locomotive Boiler. Iron Columns, several sizes. One Lathe. Blow-offs, all sizes.  
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Successor to Busseus & Cunliffe,  
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**FLY WHEEL**  
made by Garrison, Pittsburgh; 18 ft. diam.; weight 20 tons; 8 sections. Also 10 inch Shaft for same.

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1 42 x 60 Vertical Corliss Engine.  
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1 100 H. P. Fire Box Boiler. "New."  
1 100 H. P. Westinghouse Engine. "Good order."  
1 Columbus Blowing Engine 16 x 24, 32 x 24.  
Also a large number of other engines, boilers and machine tools. Write for prices.  
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One latest pattern Edison 45 K. W. Dynamo, 125 volts; speed 100 (800 lights); complete with voltmeter and rheostat; never been used.  
**AMERICAN ENGINE CO.,** Bound Brook, N. J.

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One second-hand plain milling machine in good condition; state make, capacity, and how long used.  
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One Blakeney Cupola Furnace No. 2, with 28 ft. shell and stack complete; also several foundry ladles from 100 to 4,000 pounds capacity; also one second-hand 46-inch fan blower, in good condition.  
**AMERICAN ENGINE CO.,** Bound Brook, N. J.

**SECOND-HAND MACHINERY.****ENGINE LATHES.**

10 in., 11 in. and 13 in. Swing, 4 and 5 ft. Bed Lathes, Reed, Prentice and L. & M.  
15 in., 18 in., 18 in., 19 in. and 20 in. Swing, 6 and 8 ft. Bed Lathes, Dustin, Pond, Young, Fifield and Bullard.  
24 in., 28 in., 28 in., 32 in. and 36 in. Swing, 10 ft., 16 ft. and 18 ft. Bed Lathes, Fifield, Dustin, Blaisdell and Perkins.

**PLANERS.**

1 17 in. x 17 in. x 30 in. Hand Planer.  
1 16 in. x 16 in. x 3 ft. Crank Planer.  
1 17 in. x 17 in. x 3 ft. L. & M. Planer.  
1 20 in. x 20 in. x 4 ft. L. & M. Planer.  
1 24 in. x 24 in. x 9 ft. Pease Planer.  
1 27 in. x 27 in. x 5 ft. White Planer.  
1 60 in. x 60 in. x 22 ft. Heavy Planer with 4 heads.  
1 60 in. x 60 in. x 22 ft. Hepworth, 1 head.  
1 8 ft. Boring and Turning Mill with pulley attachment.

**DRILL PRESSES.**

2 20 in. Drill Presses, Prentice & Davis.  
1 20 in. x 36 in. Gap Lathe.  
8 Slate Drills, 1 one-spindle, 2 two-spindle.  
2 Pratt & Whitney 1 and 2 spindle.  
6 bench Drills.  
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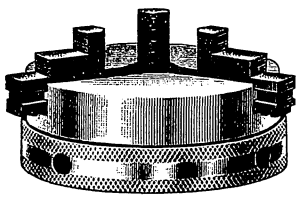
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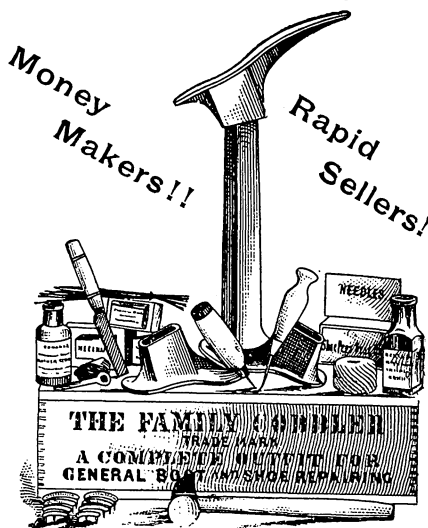
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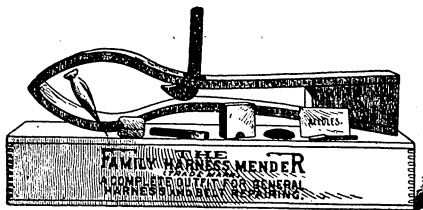
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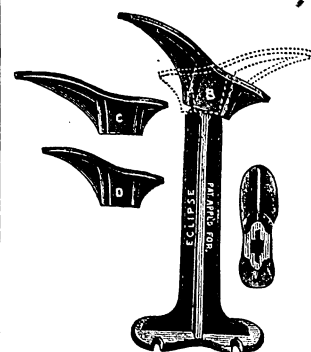
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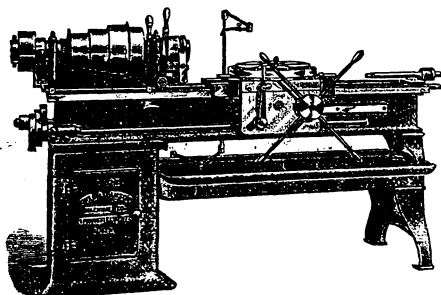
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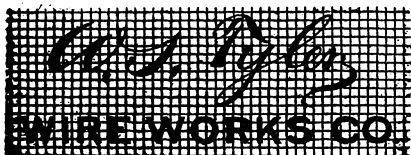
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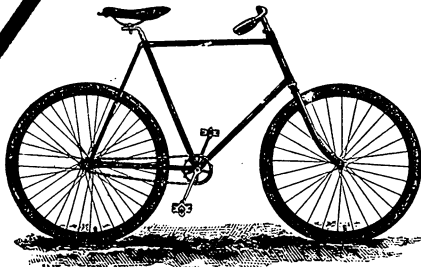
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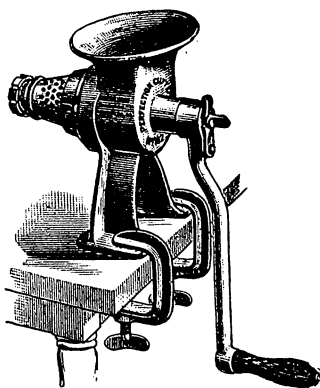
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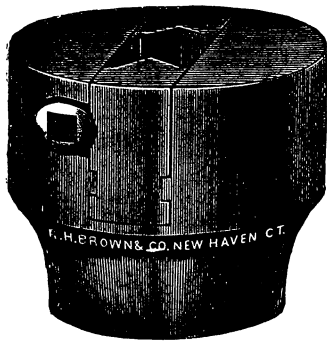
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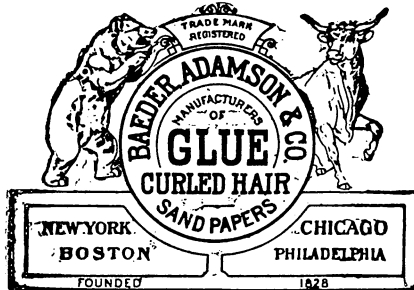


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*You take no risk on the quality.  
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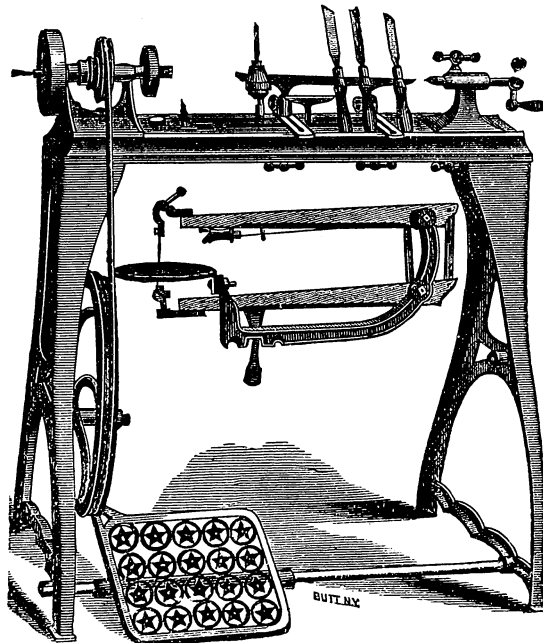
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HAIR FELTING for covering Boilers, Steam and Water Pipe, and lining Refrigerators.

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Many kinds of Scroll Saws have been put on the market by ourselves and other manufacturers during the past twelve years. Of these only a few have proved good enough to remain in demand. The call now is for a well-made, practical machine, and all second-class ones are of slow sale.

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These two machines are taking the place of all others, and are now the most in demand throughout the world.

No dealer can make a mistake by laying in a stock of them. About Christmas time they are wanted in every town, and will make business lively at this otherwise dull season.

We also keep a full stock of Designs, Wood, and all other Scroll Sawing goods.

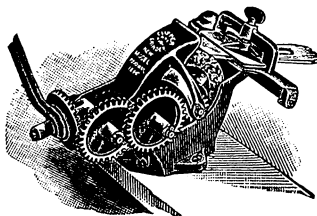
Price of Goodell Lathe, complete, \$12.00.

Price of Rogers Saw, complete, \$3.50.

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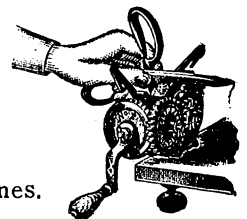
We make five sizes, Nos.

1, 2, 3, 4, and 5.

No. 1 for joiners' use.

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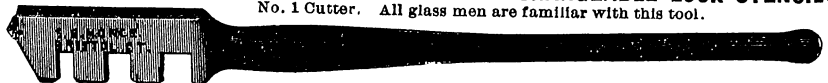
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MONCE'S NOVELTY GLASS CUTTERS. — INTERCHANGEABLE LOCK STENCILS.

No. 1 Cutter. All glass men are familiar with this tool.



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Oh yes It is imitated, but we never sold so many as at present. Make sure name is stamped on them.

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OF EVERY KIND.

DRAWER LOCKS,

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A complete line of more than 1000 list numbers exclusive of our old  
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If it is you have made a sale. **HUNDREDS of THOUSANDS of PLEASED and SATISFIED CUSTOMERS** testify to the merits of

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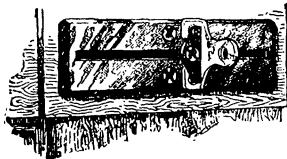
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ought to know about the "Salem" hanger. A **DOZEN TENANTS** can hang a **DOZEN DIFFERENT WIDTH** shades and not use a screw. A **HOUSE TEN YEARS OLD** with the "Salem" on the casing will not have one damaging screw hole, where a house without it will show **HUNDREDS**. The hardware trade gladly supplied with samples and prices.

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**Safety Alarm Cash Tills**  
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Prices the same for either drawer.

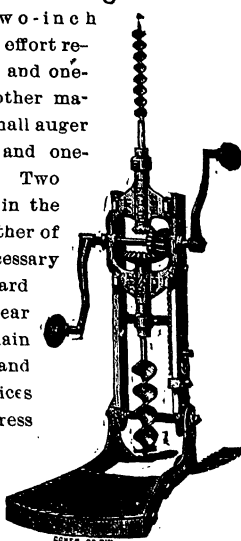
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Will operate a two-inch auger with the same effort required in using one and one-half inch in any other machine, and for the small auger have a speed two and one-half times faster. Two augers may be kept in the machine, to use either of which it is only necessary to point it downward by first taking the gear frame out of main frame, inverting and replacing it. For prices and discounts address

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THE OLDEST AND MOST EXTENSIVE MANUFACTURERS OF

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A LARGE CAPACITY AND EASY WORKING PUMP FOR

Water Works, Sewer Contractors, Foundation Builders, Mines, Quarries;

Fig. 200.

Fig. 381.

Fig. 145.

or wherever it is desired to raise a large quantity of water by  
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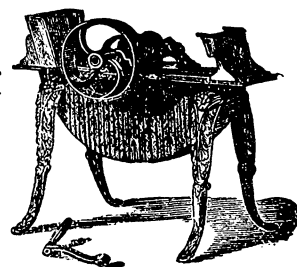
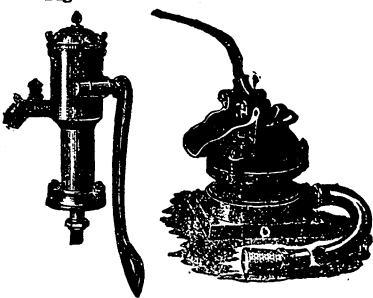
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from 3,000 to 4,500 gallons per hour.

These pumps are simple, durable and low priced.  
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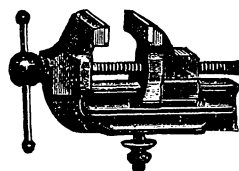
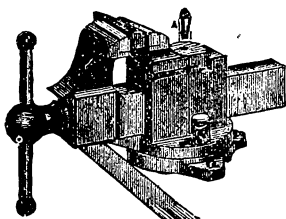
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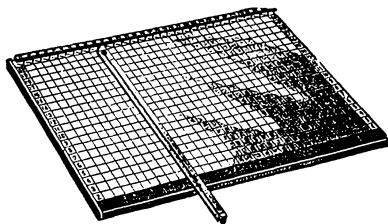
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The best, most complete, most durable and most convenient Glass Cutting Board in the market. It is indispensable to any retailer of window glass, and will save its cost in a very short time. Send for descriptive circular and price.

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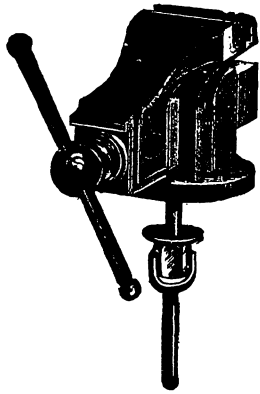
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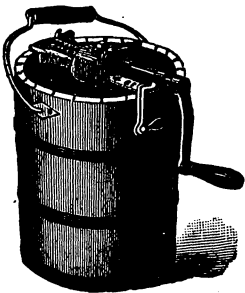


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Specially adapted for drill press work where chucks cannot be used and equally good for special or regular bench work.

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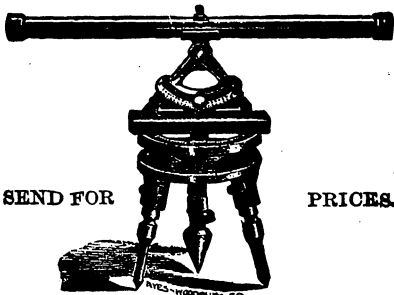
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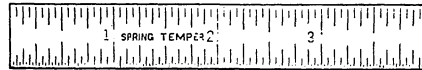
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THE BEST AND MOST RELIABLE  
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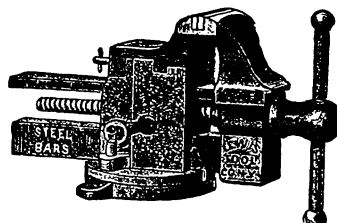
Chas. Churchill & Co., Ltd., 21 Cross St., Finsbury, E.C.

BERLIN:

Schuchardt & Schütte, 59 Spandauerstrasse.

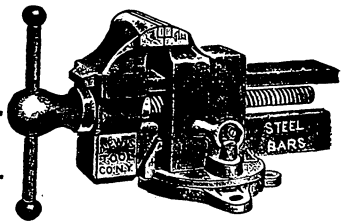
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All Kinds of  
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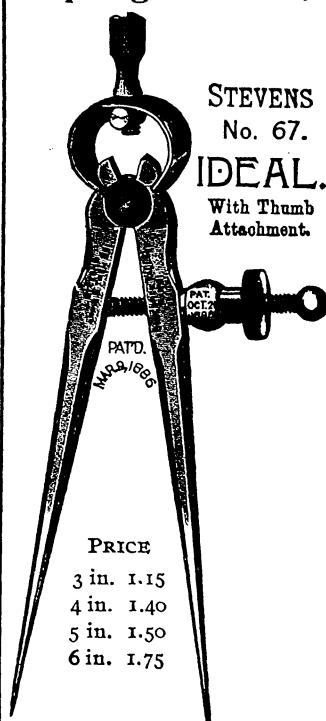
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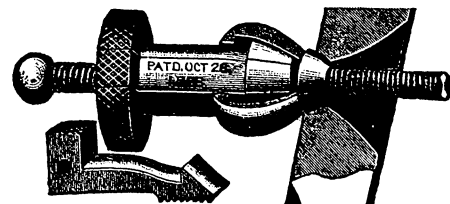


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3 in. 1.15  
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DUPLICATE PARTS.

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"IDEAL"

Patent Nut and Washer Combined,

SHOWING SECTIONAL PARTS.

The nut is closed against the screw by means of a washer which slides on the screw, and which, when forced toward the nut acts by means of inclined surfaces to press the sections of the nut against the screw.

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Wheeler, Madden & Clemson Mfg Co., Wood-rough & McParlin, Richardson Brothers, Harvey W. Peace Co., Monahan Steel Works, Wood-rough & Clemson, Pennsylvania Saw Co.

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## WENTWORTH'S PATENT NOISELESS SAW VISES, WITH RUBBER CUSHIONED JAWS.

Prevent all vibration and render Saw Filing noiseless.  
Will make no more noise than Filing on a Solid Piece of Iron.

Have a Larger Sale than All Other Kinds Combined.

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No. 2 (15 inch Jaws),	-	21.00
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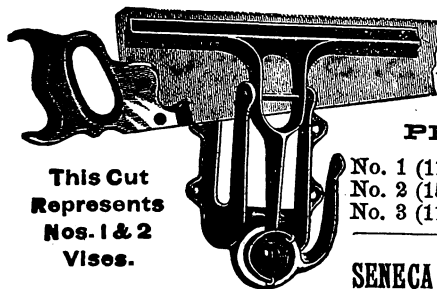
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Sold by all leading jobbers of gen-  
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This Cut  
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Nos. 1 & 2  
Vises.



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Furnish your Trade with the Best Saws.

The ATKINS Saws Lead them all.



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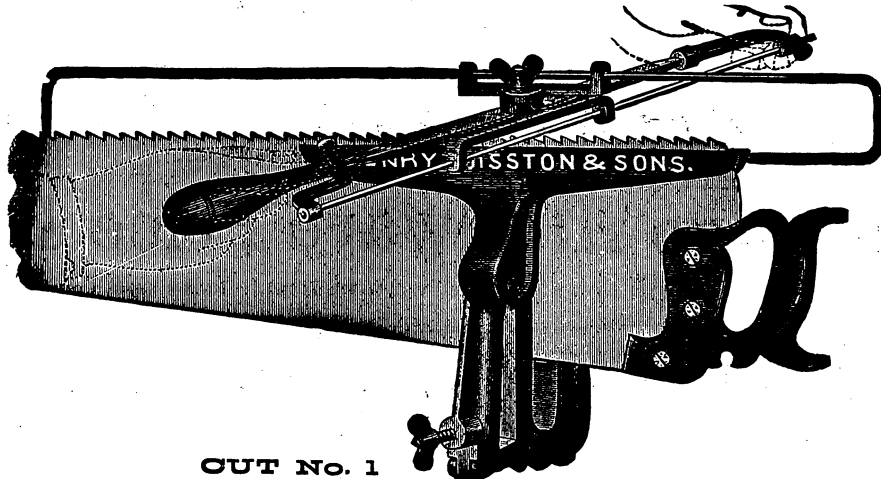
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2083 2084 2085 2086 2087 2088 2089 2090 2091 2092 2093 2094 2095 2096 2097 2098 2099 2100 2101 2102 2103 2104 2105 2106 2107 2108 2109 2110 2111 2112 2113 2114 2115 2116 2117 2118 2119 2120 2121 2122 2123 2124 2125 2126 2127 2128 2129 2130 2131 2132 2133 2134 2135 2136 2137 2138 2139 2140 2141 2142 2143 2144 2145 2146 2147 2148 2149 2150 2151 2152 2153 2154 2155 2156 2157 2158 2159 2160 2161 2162 2163 2164 2165 2166 2167 2168 2169 2170 2171 2172 2173 2174 2175 2176 2177 2178 2179 2180 2181 2182 2183 2184 2185 2186 2187 2188 2189 2190 2191 2192 2193 2194 2195 2196 2197 2198 2199 2200 2201 2202 2203 2204 2205 2206 2207 2208 2209 2210 2211 2212 2213 2214 2215 2216 2217 2218 2219 2220 2221 2222 2223 2224 2225 2226 2227 2228 2229 2230 2231 2232 2233 2234 2235 2236 2237 2238 2239 2240 2241 2242 2243 2244 2245 2246 2247 2248 2249 2250 2251 2252 2253 2254 2255 2256 2257 2258 2259 2260 2261 2262 2263 2264 2265 2266 2267 2268 2269 2270 2271 2272 2273 2274 2275 2276 2277 2278 2279 2280 2281 2282 2283 2284 2285 2286 2287 2288 2289 2290 2291 2292 2293 2294 2295 2296 2297 2298 2299 2300 2301 2302 2303 2304 2305 2306 2307 2308 2309 2310 2311 2312 2313 2314 2315 2316 2317 2318 2319 2320 2321 2322 2323 2324 2325 2326 2327 2328 2329 2330 2331 2332 2333 2334 2335 2336 2337 2338 2339 2340 2341 2342 2343 2344 2345 2346 2347 2348 2349 2350 2351 2352 2353 2354 2355 2356 2357 2358 2359 2360 2361 2362 2363 2364 2365 2366 2367 2368 2369 2370 2371 2372 2373 2374 2375 2376 2377 2378 2379 2380 2381 2382 2383 2384 2385 2386 2387 2388 2389 2390 2391 2392 2393 2394 2395 2396 2397 2398 2399 2400 2401 2402 2403 2404 2405 2406 2407 2408 2409 2410 2411 2412 2413 2414 2415 2416 2417 2418 2419 2420 2421 2422 2423 2424 2425 2426 2427 2428 2429 2430 2431 2432 2433 2434 2435 2436 2437 2438 2439 2440 2441 2442 2443 2444 2445 2446 2447 2448 2449 2450 2451 2452 2453 2454 2455 2456 2457 2458 2459 2460 2461 2462 2463 2464 2465 2466 2467 2468 2469 2470 2471 2472 2473 2474 2475 2476 2477 2478 2479 2480 2481 2482 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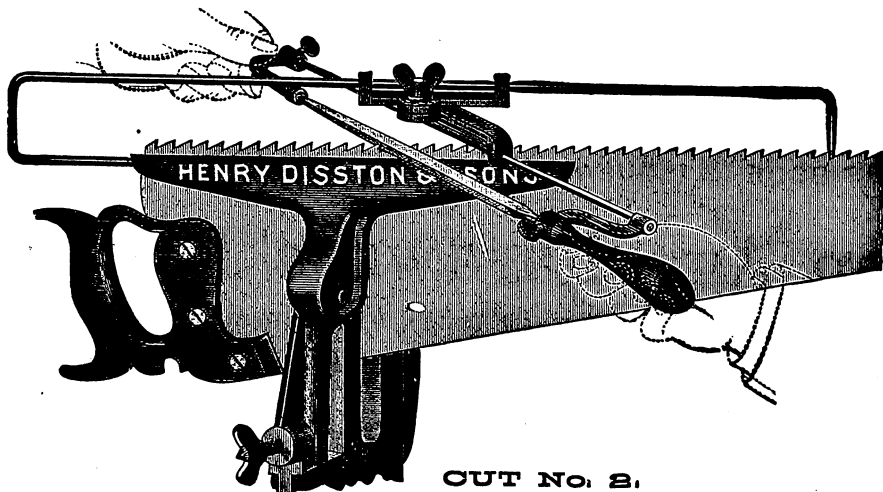
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CUT No. 2.

To obtain the correct position, loosen the wing nut and move the guide around to the point desired; after tightening wing nut, loosen screw in file handle, then turn handle until file gives the shape tooth wanted.

A good way is to select a tooth of correct shape and let file down into it, tighten set screw in handle, then file a tooth to see if the shape suits. If not turn the file a little to the right or left and try another tooth until the proper shape is obtained. Then file every other tooth, see cut No. 1; when one side is filed, reverse saw and attachment and adjust as in No. 2, and file the other teeth. For Rip Saws, place the file at right angles with the saw and file every tooth. Always keep the file as nearly horizontal as possible.

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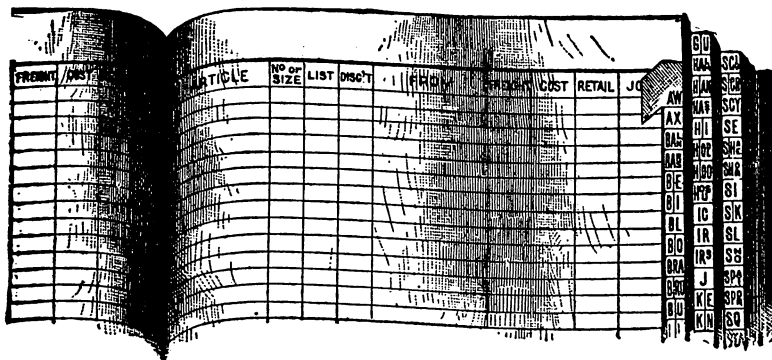
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*Fac-Simile of Indexing.*

**SIZE.**—The book is 7 x 10 inches (much larger than Price Books A, B, C, or D), 350 pages.

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**INDEX.**—By means of the arrangement shown in the cut the index applies to every page (except Supplement) and permits reference to any article at a single motion. This greatly facilitates the use of the book, avoiding the troublesome turning from page to page which is necessary in connection with other Price Books. It has been prepared with great care, and it is believed that it provides a place for every article in the Hardware line.

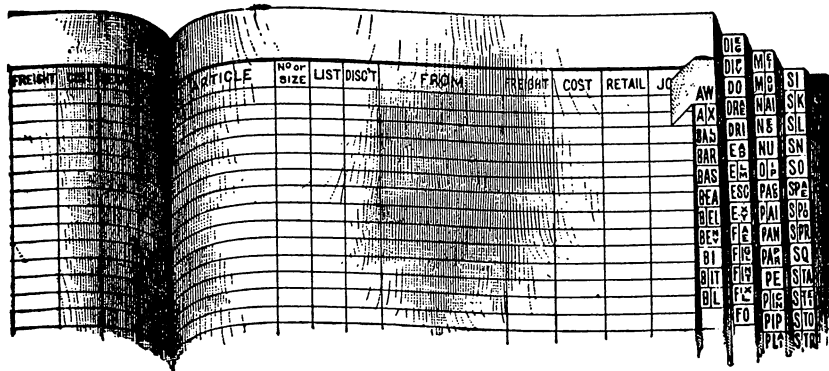
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**SUPPLEMENT.**—A 40-page Supplement is provided to give room for supplemental quotations, memoranda, tables, &c.

**THIS BOOK IS ISSUED IN ONLY ONE EDITION, PRICE, \$5.00.**

## The Iron Age Hardware Price Book F.

WITH MULTIPLE INDEX (Patent Pending).



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Sufficient space has been provided for large lines of goods such as Axes, Bits, Springs, etc., by allowing four pages to such indices, instead of two pages, as for lines of goods requiring less space. This is accomplished, as in AX for example, in Book F by having a short tab with the letter A on the tab on the first leaf, and AX on the tab on the second leaf. The A on the first leaf is directly over the A on the lower leaf, so that the index reads AX whether looking at both leaves together, or at the lower one only.

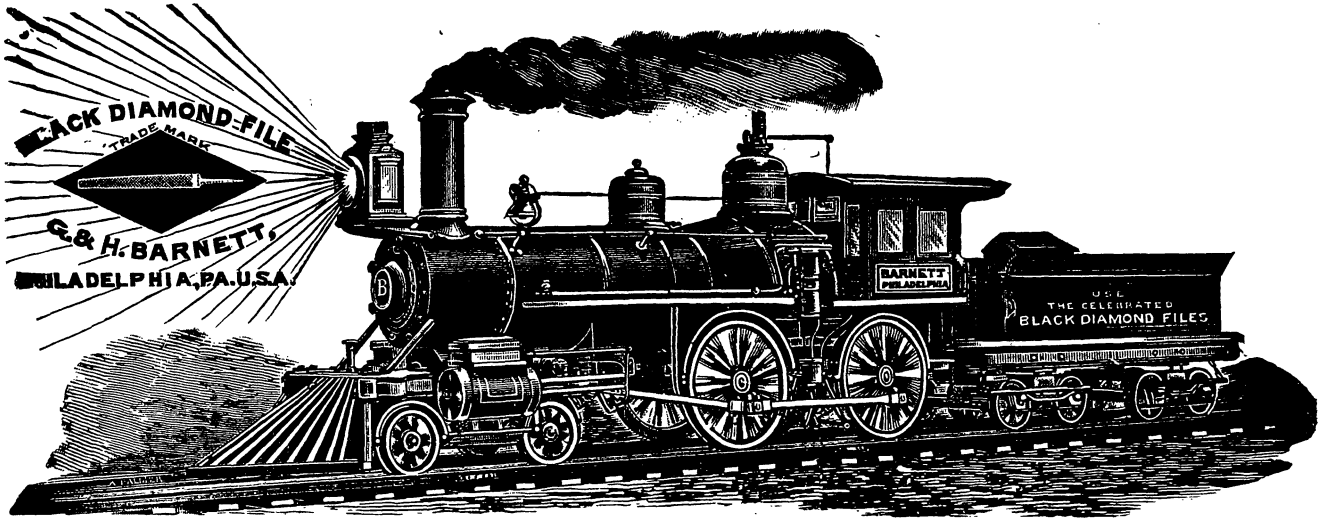
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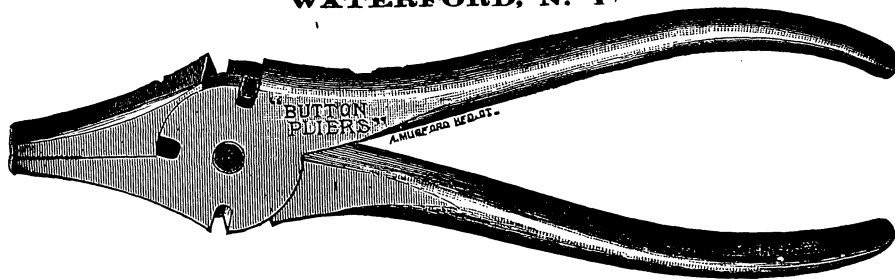
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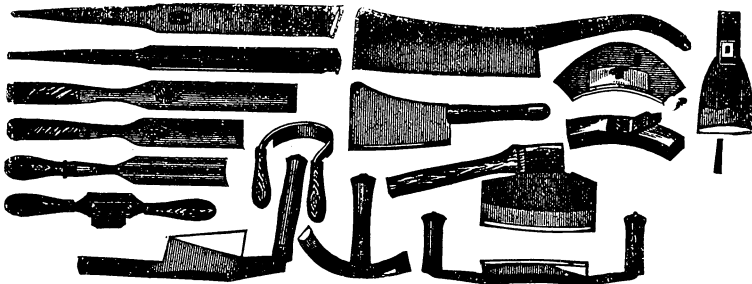
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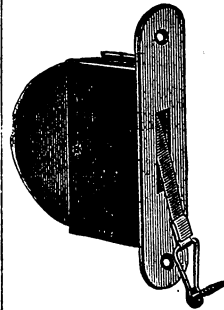
**BRIDGEPORT, - CONN.**

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What makes your Sash Balance so durable?  
**THE STEEL FRAME.**

What frames do other Sash Balance manufacturers use?

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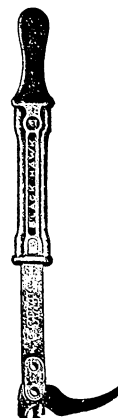
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Our Latest Pattern is



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Salesroom and Office, Hartford, Conn.

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Flower Tea Spoon  
FULL SIZE.



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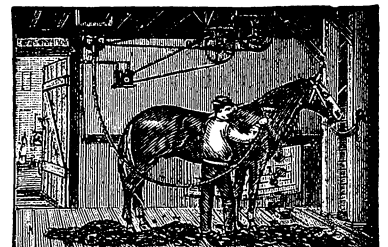
First Prize, Highest Medal of Award, World's Fair, Chicago, Ill., 1893.



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GILLETTE'S CELEBRATED HAND POWER MACHINE.



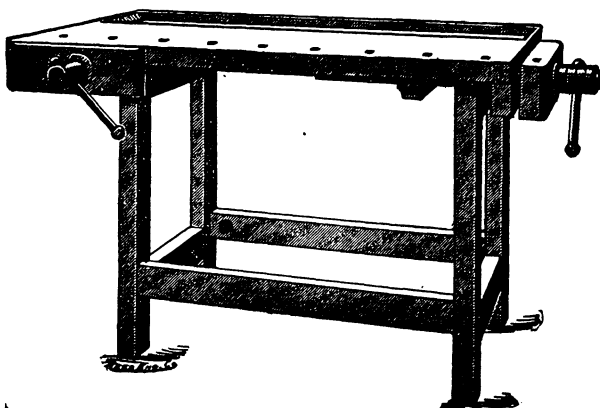
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Greatest Variety of Power Horse Clipping Machines In the World.

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A popular idea for parents is to cultivate the mechanical ambition of their boys. This Bench is similar to a regular Cabinet Makers' Bench, but smaller. Length over all, 4½ ft., width 20 inches, with 13-inch glued up top and fitted with head and tail vises.

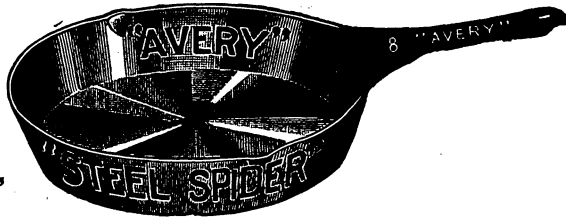
Dealers sold a great many last year for the holiday trade.

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Maslins,  
Scotch Bowls,  
Stew Pots,  
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Etc.,

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Quick Shipments.  
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No Delays.

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Send for REVISED CATALOGUE. Every wide awake dealer should have it.

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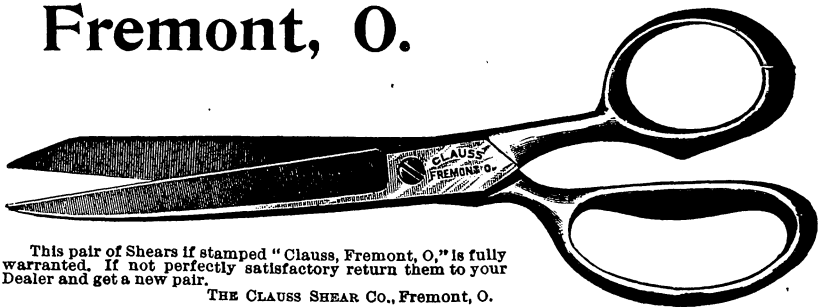
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**Fremont, O.****Clauss**

This pair of Shears if stamped "Clauss, Fremont, O." is fully warranted. If not perfectly satisfactory return them to your Dealer and get a new pair.

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**THE CLAUSS SHEAR CO.,****Fremont, O., U. S. A.,**

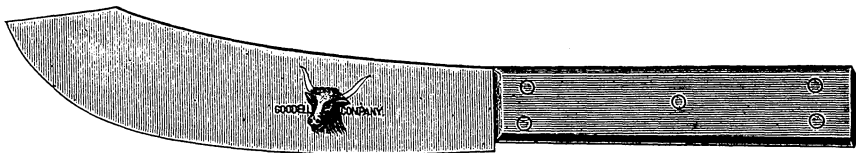
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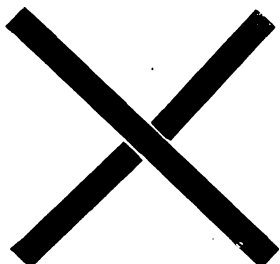
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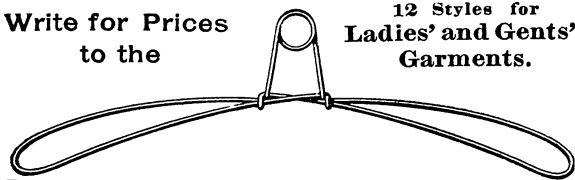
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Write for Prices  
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Ladies' and Gents'  
Garments.

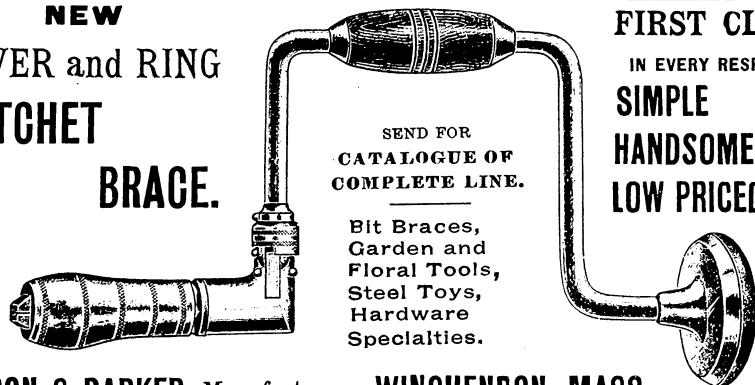
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LEVER and RING  
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Bit Braces,  
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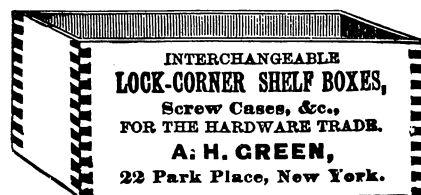
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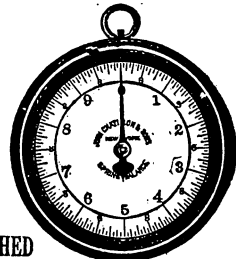
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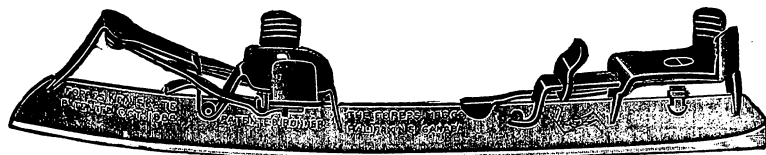


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WE DON'T MAKE THE CHEAPEST SKATE,

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Are Built to Create Business.  
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OUR WHEELS ARE

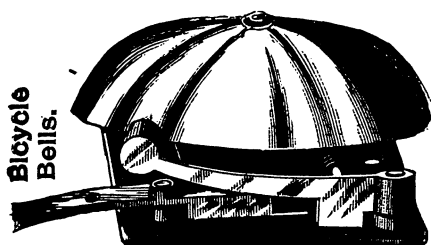
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KEEP ON TURNING, DO NOT PULL.

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BE YOUR OWN SANDOW

You can find nothing which will sell better  
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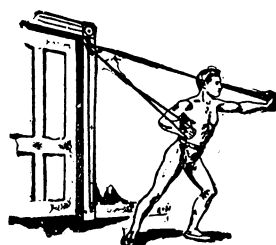
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Order a sample of the "Holiday Number." It  
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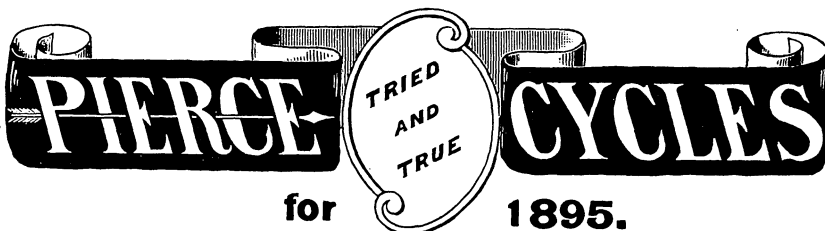
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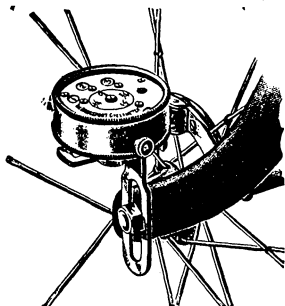
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Three Styles for 1895. Models 'A,' 'B,' & 'C.'  
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Guaranteed to be Accurate, Noiseless and  
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"MODEL A" registers 10,000 miles accurately and repeats, or can be set back to zero at will. Nickel finish with celluloid dial. The figures on dial have been enlarged so that same can be read from saddle with ease. The bracket and dog have also been improved. Made for 28 and 30 inch wheels. Weight, 6 ounces.

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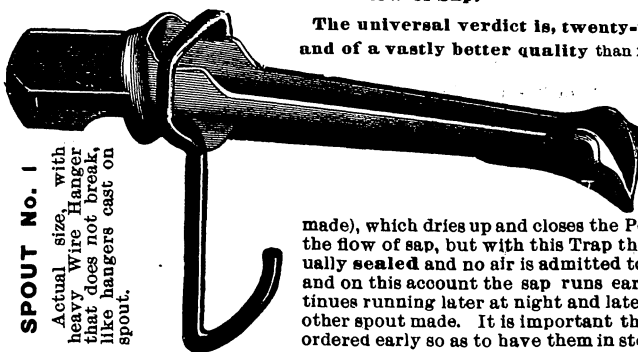
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SPOUT No. 1  
Actual size, with heavy wire hanger that does not break, like hangers cast on spout.

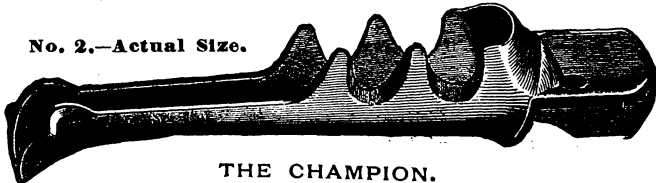
The Patent Air Trap is one of the essential features found only in the Improved Eureka, and without which the air would be freely admitted (as it is in all other spouts made), which dries up and closes the Pores and materially lessens the flow of sap, but with this Trap the discharge hole is effectually sealed and no air is admitted to freeze or dry up the sap and on this account the sap runs earlier in the morning, continues running later at night and later in the season than any other spout made. It is important that these goods should be ordered early so as to have them in stock when the season opens.

Send for Sample and Circular.

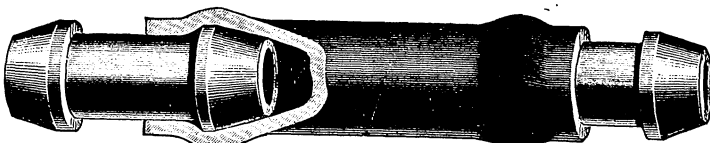
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Houses.

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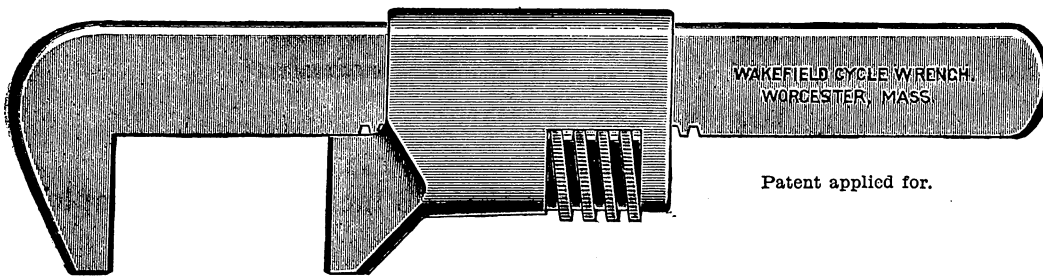
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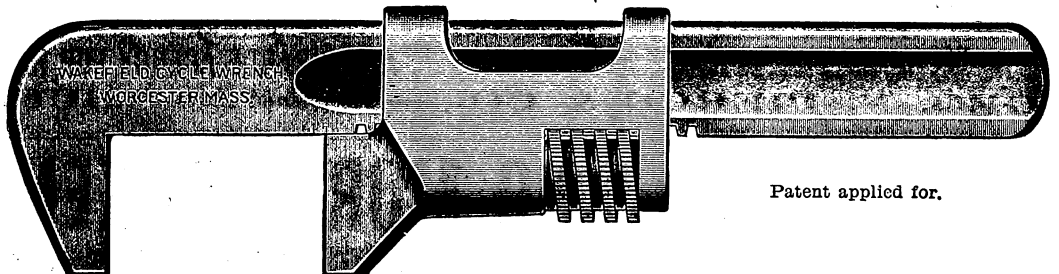
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Patent applied for.

No. 00-6 OUNCES



Patent applied for.

No. 0-5 OUNCES.

**FULL SIZE, 5½ INCHES LONG. JAWS 1¼ INCH THICK. OPENS 1¾ INCHES.**

Made entirely of steel, hardened, finely finished, and nickel plated. All parts made to a gauge, and are interchangeable. For strength, lightness, quick action and durability it has no competitor.

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WE MAKE ONLY

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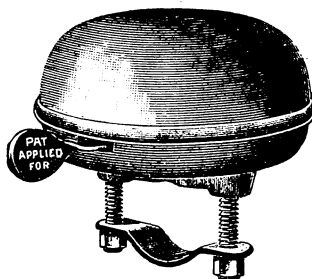
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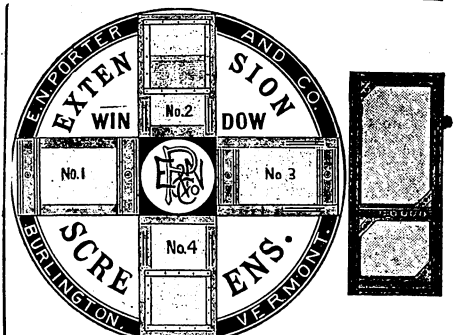
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**BELLS of all kinds. 15 styles of BICYCLE BELLS for season of 1895.**

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Positively no others have it.

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Results Are Simply Wonderful.

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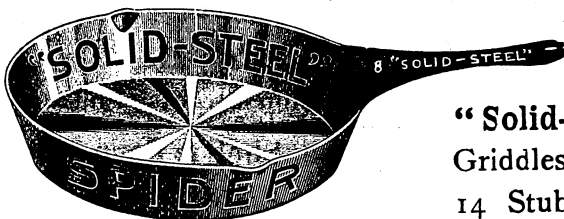
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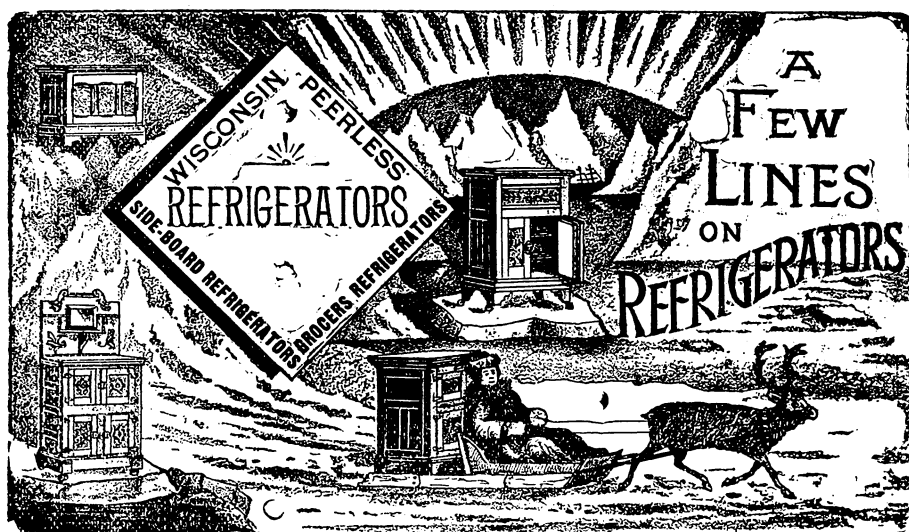
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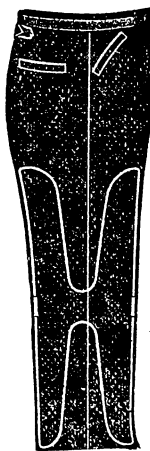
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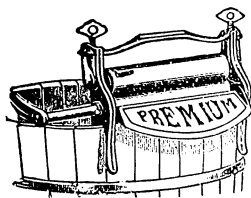


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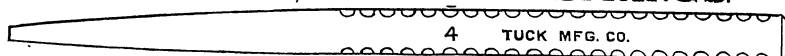
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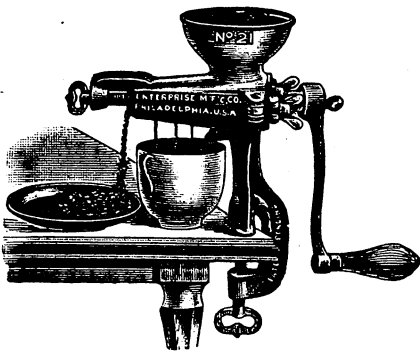
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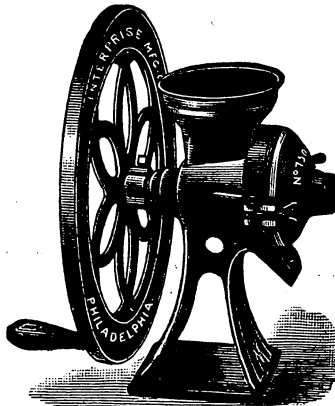
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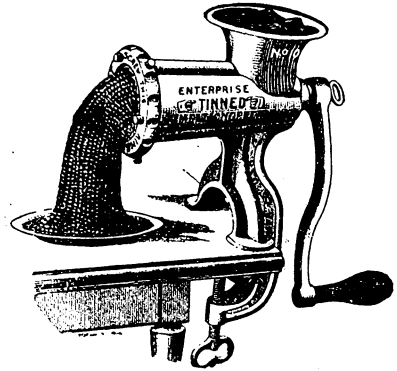
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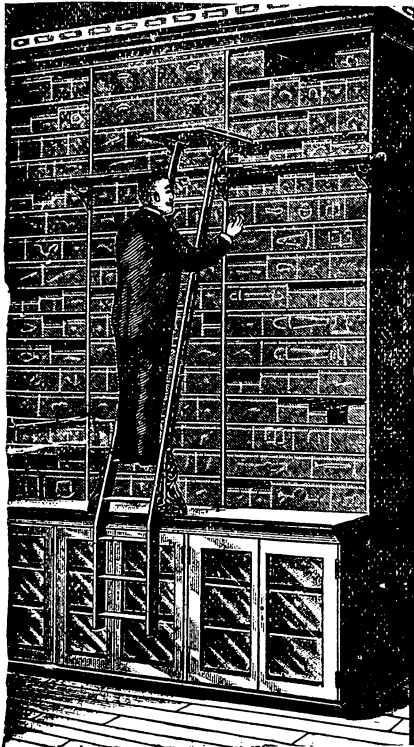
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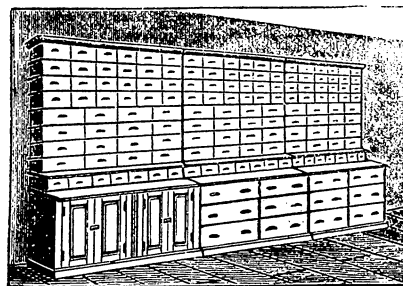
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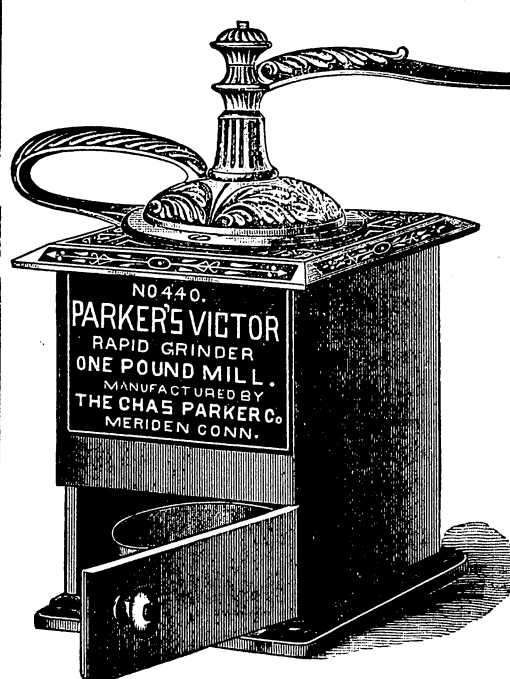
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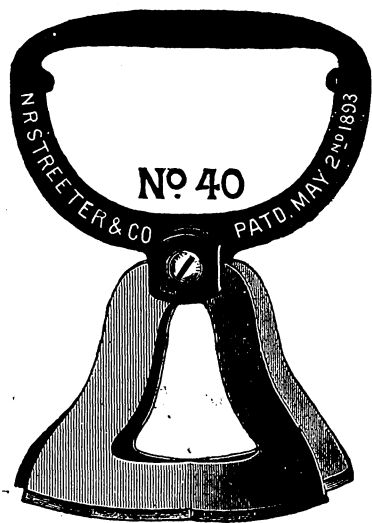
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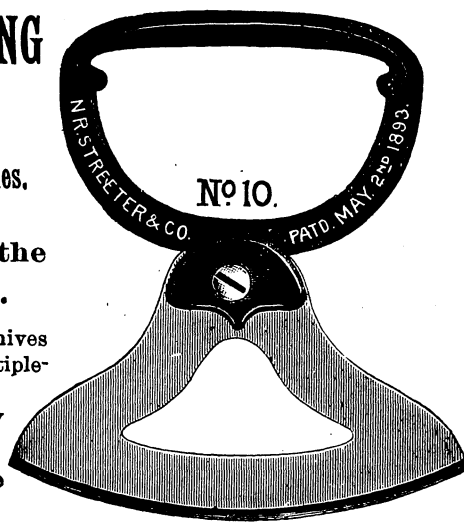
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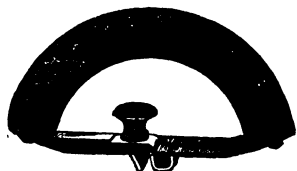
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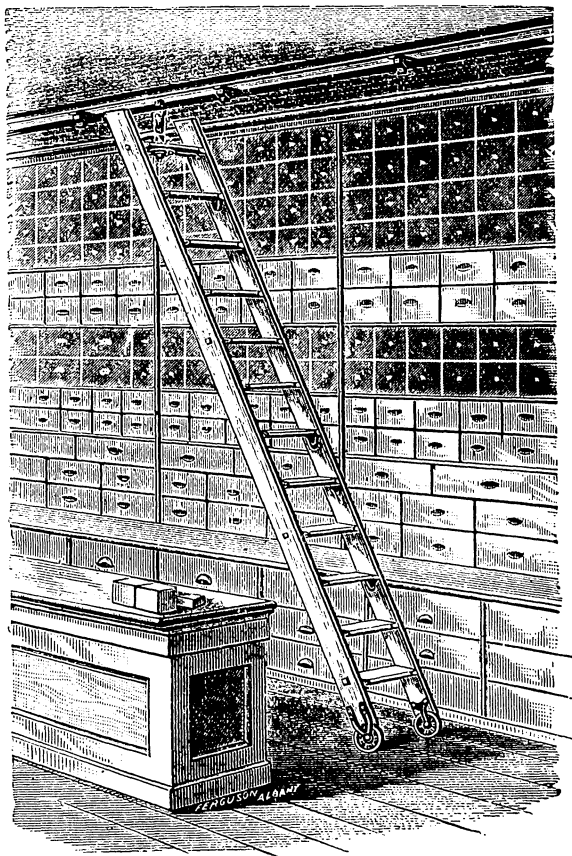
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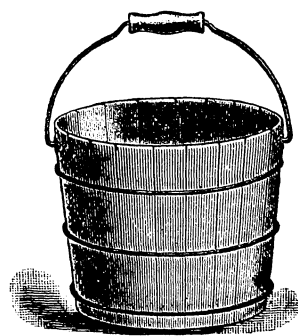
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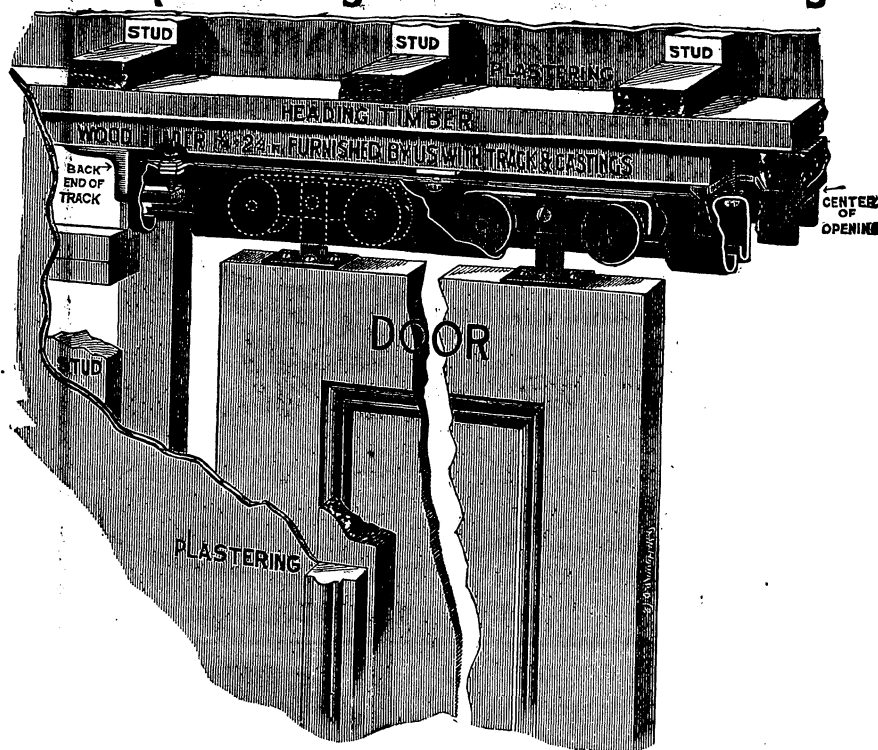


Pat. March 24th, 1891,  
and April 10th, 1894.

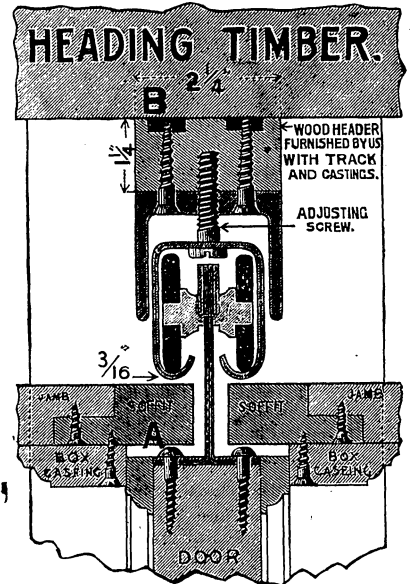
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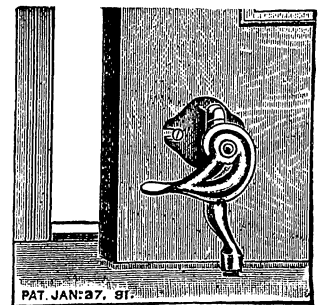
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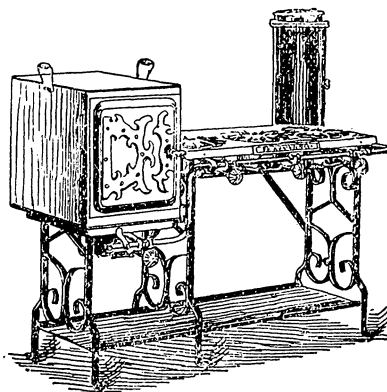
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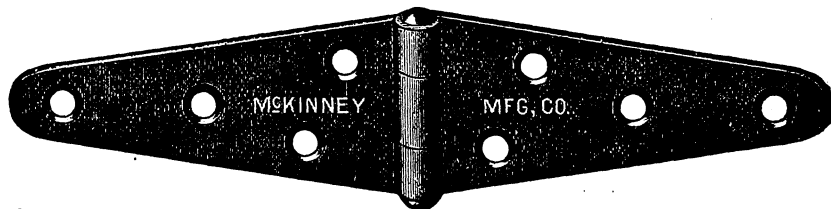
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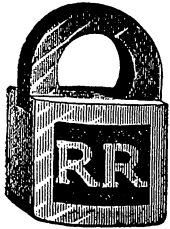
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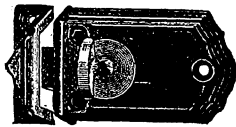


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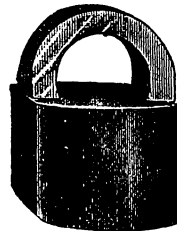
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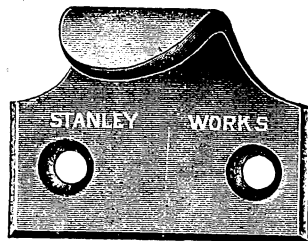
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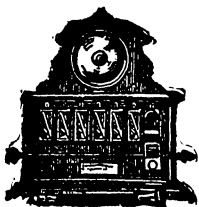


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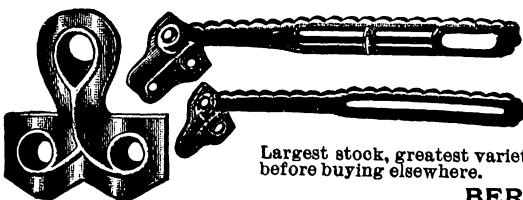
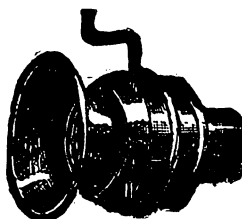
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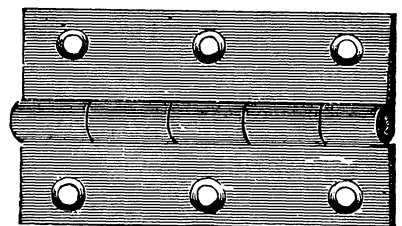
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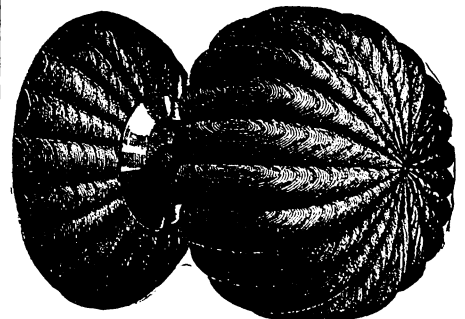
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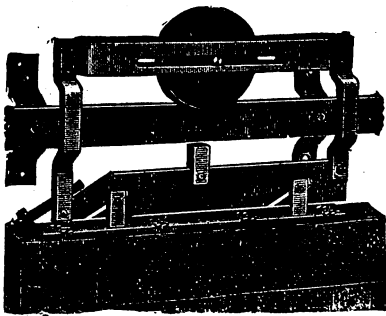


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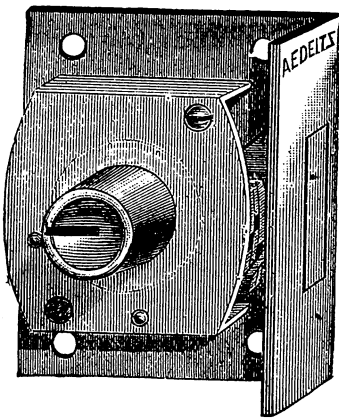
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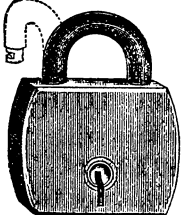
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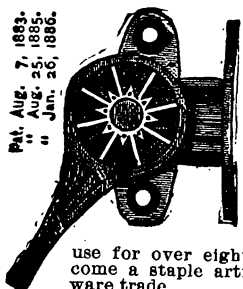
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Fig. 107.—Planishing Tea-Kettle Side.

### CONTENTS:

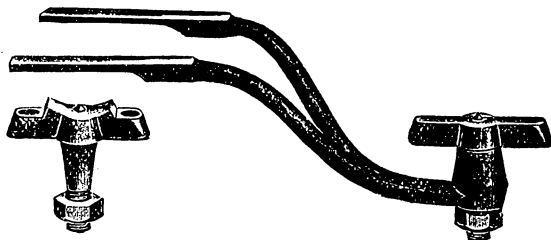
Historical Sketch of Copper; Braziers' Art, or Light Coppersmithing; First Year's Experience; Repairing and Tinning; The Boy's Second Year; Making Washing Coppers; Making Small Brewing Coppers; Table of Dimensions and Capacity; Making Hand Bowls; Making Frying Pans; Making Closet Pans; Making Water Balls; Mounting for Copper Goods; Glue Pots and Tea-Kettles; Oval Tea-Kettles; Beer Mullers; Funnels; Coffee Pots; Saucepans and Pudding Pots; Stewpans; Stock Pots; Fish Kettles; Brazing Pans; Tea Boilers; Warming Pans; Preserving Pans; Dripping Pans; Coal Scoops and Coal Hods; Making Coal Scoops; Planishing and Smoothing; Cranes or Syphons; Pumps; Appliances of Railway and Marine Coppersmiths; Making Copper Pipe; Piecing and Joining Pipes; The Fire Pots; Fire Pot Set for Brazing Joint; Soft Soldering Large Joints; Taking Templates; Filling and Bending; Making Bends; Template Boards; Patching Pipes; Outlets; Expansion Joints; Tee Pieces; Three-way Pieces; Cross or Four-way Pieces; Saddle Fire; Marine Work; View of Maudsley, Sons & Field's Shop; Making Large Bends; Making Double Bends; Brazing on Flanges; Short Bends; Air Pipes for Ships; Making Hollow Spheres; Brazing Sheet Brass; Locomotive Brass Work; Brass Dome Covers; Heavy Pipes for Breweries; Brewing Coppers or Kettles; Dome Coppers; Dome and Pan Coppers; Tallow Coppers; Dyers' Coppers; Sugar Tiches; Stills.

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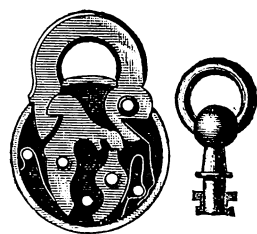
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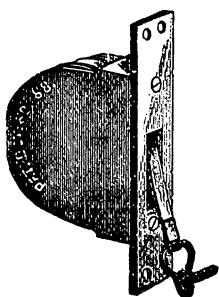
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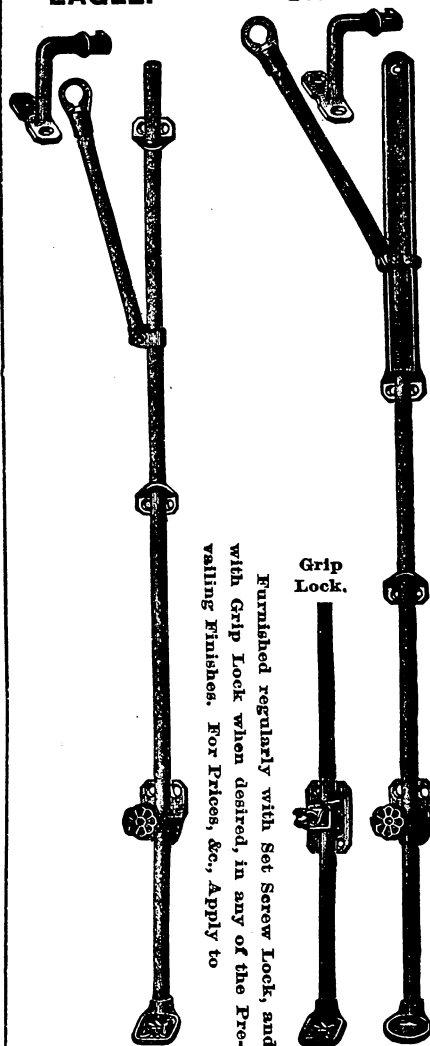
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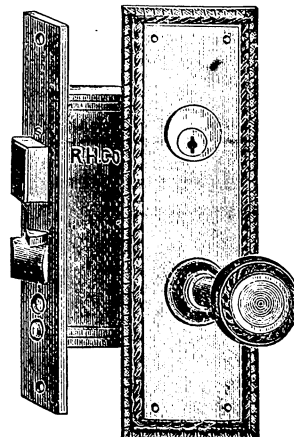
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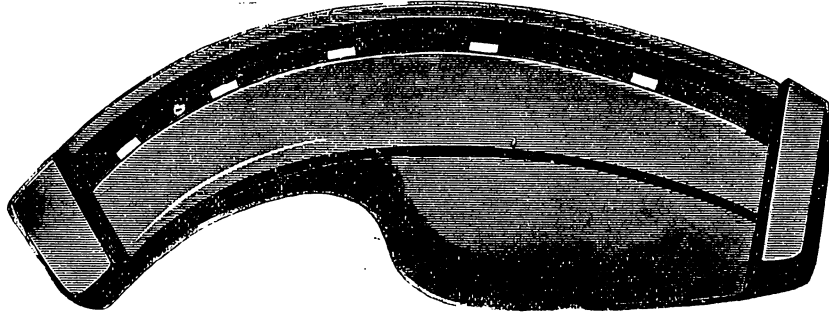


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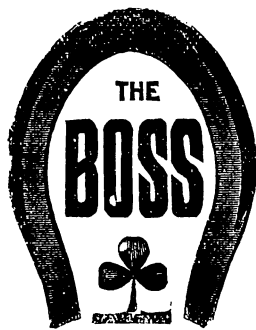
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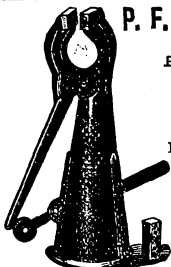
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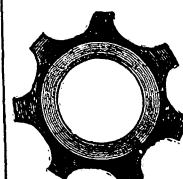


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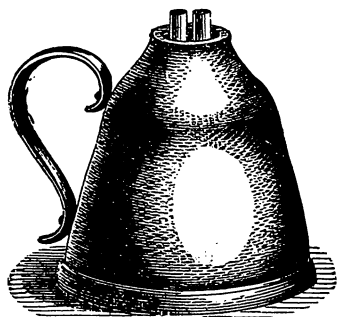


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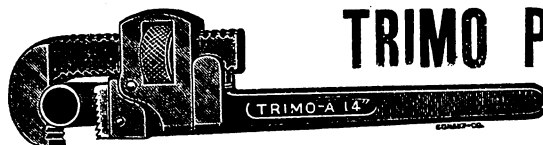
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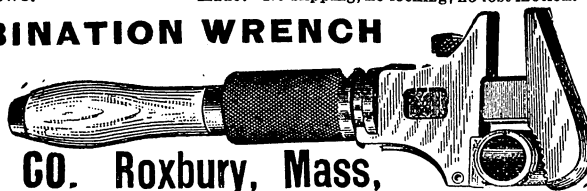
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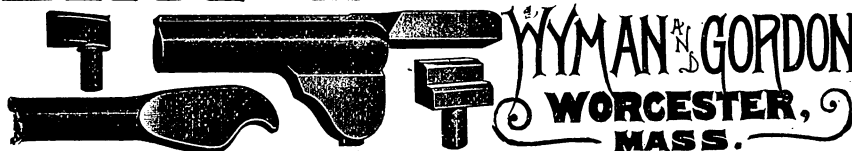
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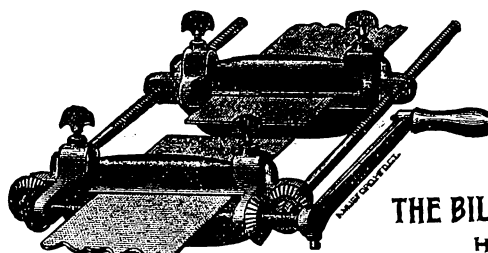


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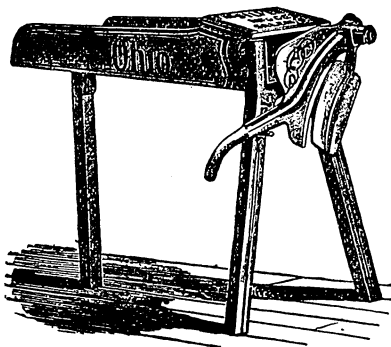
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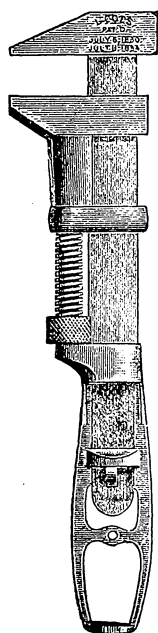
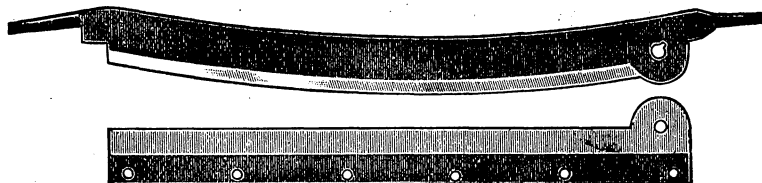
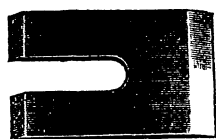
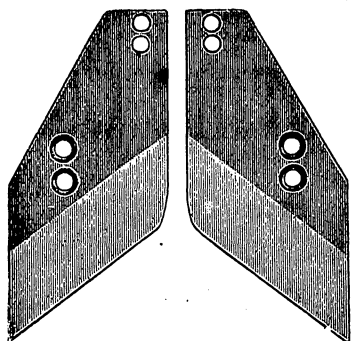
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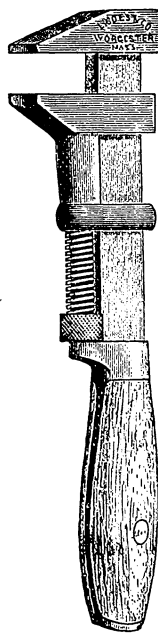
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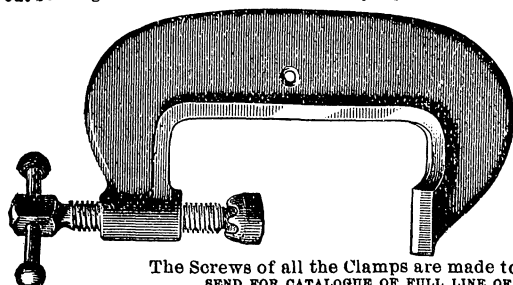
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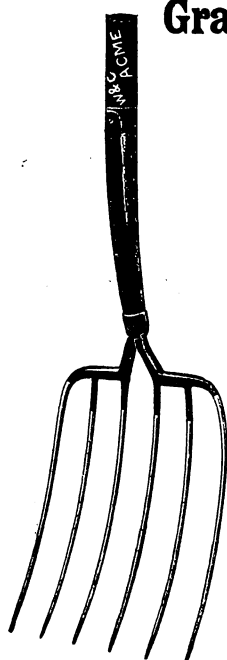
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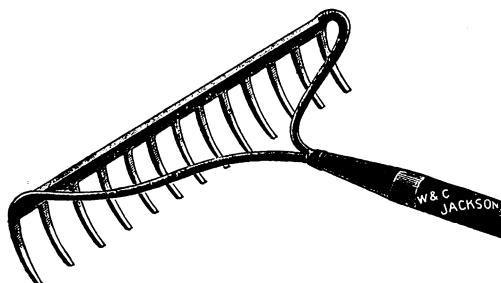
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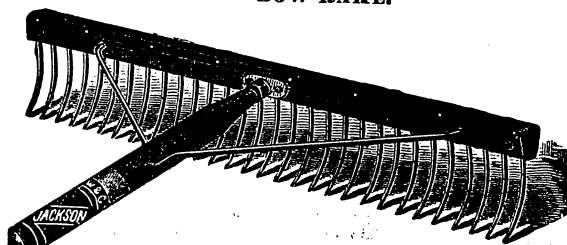
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2½	.53	.59	.68
3	.55	.62	.73
4	.60	.68	.84
5	.65	.75	.96
6	.70	.81	1.11
7	.75	.84	1.21
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### Wrenches.

Inches.	6	8	10	12	15	18	21
Black...	\$9.00	\$10.00	\$12.00	\$14.00	\$24.00	\$30.00	\$36.00
Bright..	10.00	11.00	14.00	16.00	26.00	32.00	38.00

### Stove Hollow Ware.

POTS, KETTLES, ETC. (CAST IRON.)							
No.....	6	7	8	9	10	1	
Pots.....	\$0.65	.75	.85	1.00	1.25	1.75	
Kettles.....	.55	.65	.70	.85	1.00	1.40	
T Kettles.....	.75	.80	.90	1.00	1.25		
Spiders.....	.27	.30	.35	.40	.50	.60	
Griddles Round	.22	.25	.27	.30			
" Long..	.40	.50	.60	.75			

### SCOTCH AND YANKEE BOWLS.

No.....	1	2	3	4	5	6
Scotch Bowls..	\$0.35	.40	.45	.50	.60	.70
Yankee Bowls.	.35	.45	.55	.65	.75	.90

As is obvious from the lists herewith reproduced, the shape and size of the different lists varies greatly, the aim being to give each list the smallest and most convenient arrangement possible. None of the lists are, however, more than 3½ x 6 inches in size, very few of them being as large as this and most of them very much smaller. In use it is intended that they shall be trimmed closely before they are inserted in price books, when they may be attached either by one edge close to the hinge of the book, as will, perhaps, be most convenient with the larger lists, permitting the use of the entire page for memoranda, or the smaller lists may be pasted on the page in connection with the entries in regard to discounts, freights, &c. Many of the lists are so compact in arrangement as when thus inserted to leave ample room for recording quotations.

Some merchants use this pamphlet for reference, checking off invoices, etc., as it gives the leading lists in a more convenient form than they can otherwise be obtained. The lists are, however, intended primarily to be cut out

### Glue Pots.

No.	4/0....	\$4.50	No. 2	.....	\$8.40
3/0....	5.00		3	.....	10.26
2/0....	5.50		4	.....	12.42
0	6.00		5	.....	14.58
1	6.75		6	.....	16.94

and inserted in price books, and can be used in connection with any of The Iron Age Hardware Price Books.

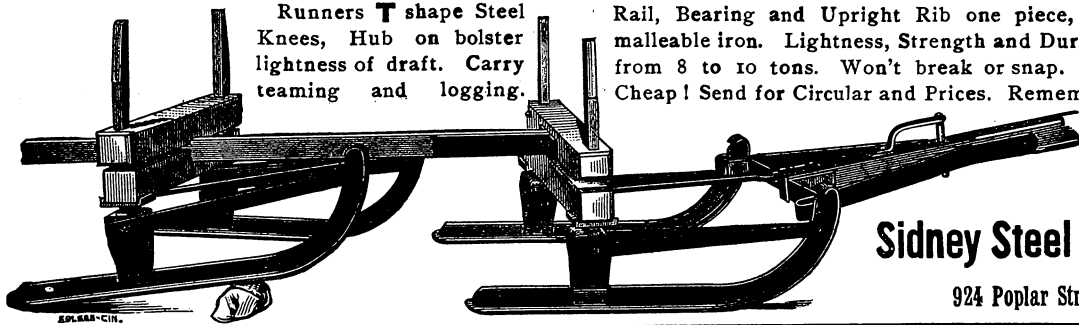
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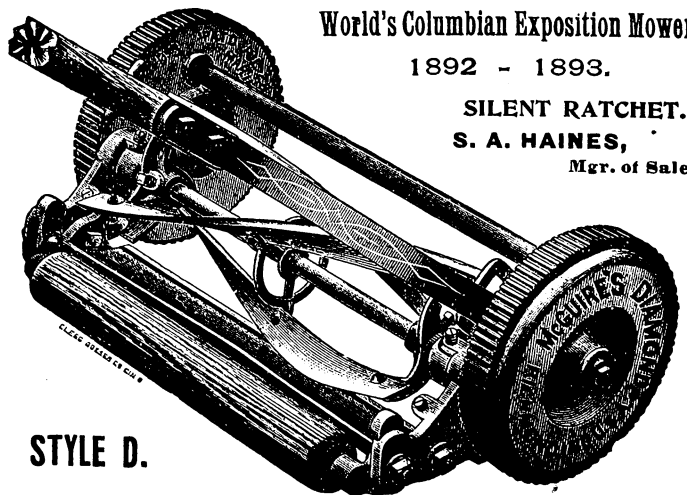
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14 "	15.00	F. O. B. Factory.
16 "	16.00	
18 "	17.00	

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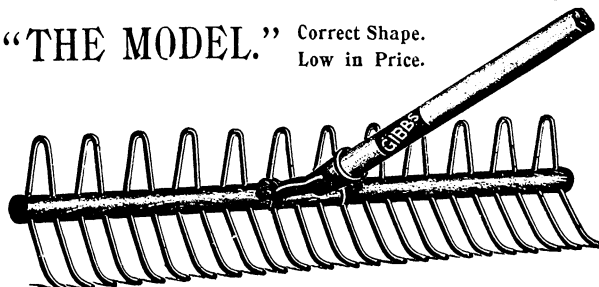
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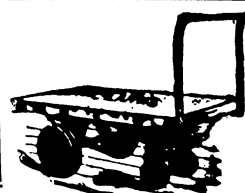
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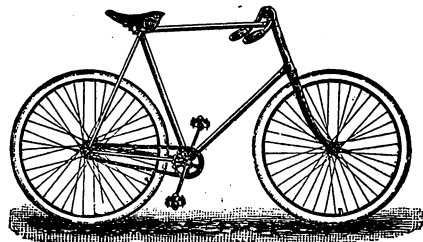
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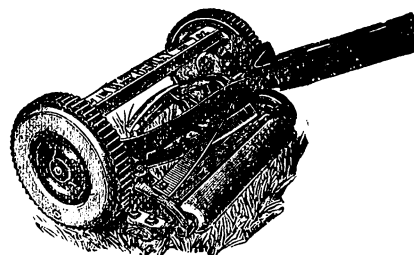
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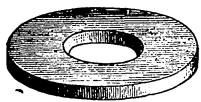
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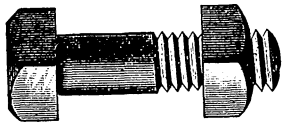
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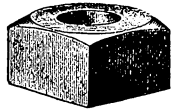
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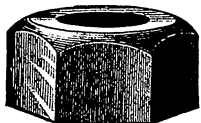
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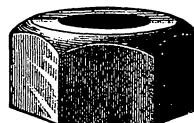
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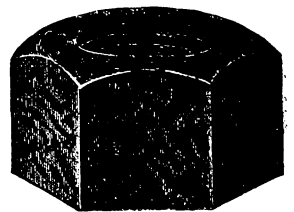


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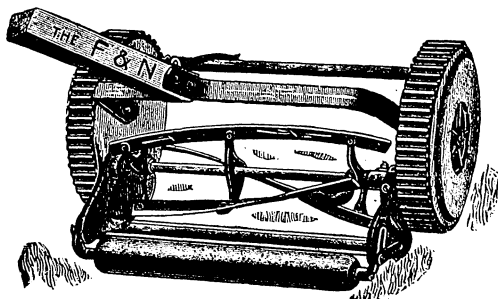
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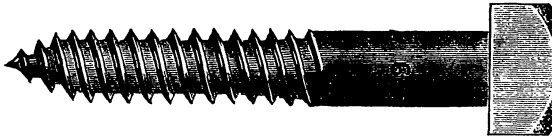
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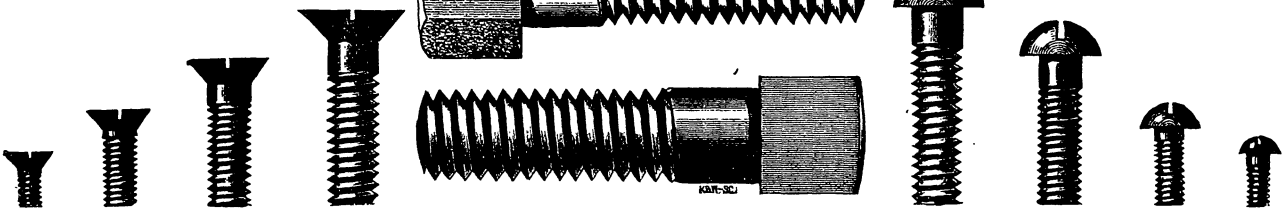
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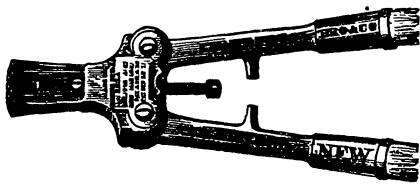


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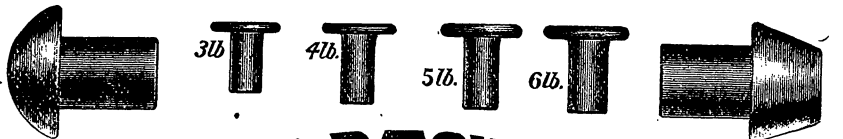
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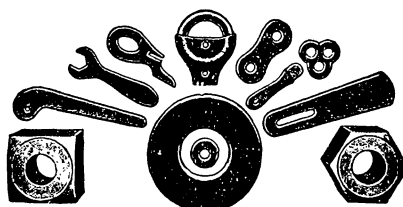


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Randolph & Clowes, Waterbury, Conn.  
Rome Brass & Copper Co., Rome, N. Y.  
Scovill Mfg. Co., Waterbury, Conn.  
Waterbury Brass Co., 290 E. way, N. Y.
- Brass Butt Hinges.**  
Tiebout, W. & J., 16 & 18 Chambers.
- Brass Founders.**  
Cramp, Wm. & Sons S. & E. B. Co., Philadelphia, Pa.  
Eynons-Evans Mfg. Co., Philadelphia, Pa.  
Fraln, E. T., Lancaster, Pa.  
Haight & Clark, Albany, N. Y.  
Keys, W. W. & R. M. Co., Bridgeport, Conn.  
North Bros. Mfg. Co., Phila., Pa.  
Reeves, Paul S., Philadelphia.
- Brass Goods.**  
Brass Goods Mfg. Co., 88 Chambers.
- Bread and Cake Knives.**  
Clausen Shear Co., Fremont, O.
- Bronze (Tobin).**  
Ansonia Brass & Copper Co., 19-21 Cliff Street, N. Y.  
Bridgeport Deoxidized Bronze & Metal Co., Bridgeport, Conn.
- Brooms and Brushes.**  
Rice Mfg. Co., New Durham, N. H.
- Builders' Hardware.**  
Deltz, A. E., 97 Chambers St., N. Y.  
Reading Hdw. Co., Reading, Pa.  
South, W. A. Co., Salem, Mass.  
Yale & Towne Mfg. Co., Stamford, Ct.
- Burr Wheels.**  
Torrance Iron Co., Troy, N. Y.
- Butchers' Steels.**  
Chatillon, John & Sons, 85-89 Cliff St., N. Y.
- Butcher and Shoe Knives, Manufacturers of.**  
Chatillon, John & Sons, 85-89 Cliff St., N. Y.  
Goodell Co., Antrim, N. H.  
Wilson, John, Sheffield, England.
- Butts and Hinges.**  
McKinley Mfg. Co., Allegheny, Pa.  
Sabin Machine Co., Montpelier, Vt.
- Stanley Works, New Britain, Conn.**  
Tiebout, W. & J., 16 Chambers, N. Y.  
Wrightsville Hdw. Co., Wrightsville, Pa.
- Cabinet Benches.**  
Grand Rapids Hand Screw Co., Grand Rapids, Mich.
- Calipers and Dividers.**  
J. Stevens Arms and Tool Co., Chicopee Falls, Mass.  
Starrett, L. S. Co., Athol, Mass.
- Car Axles.**  
Roberts, A. & P. & Co., Phila.
- Carriage Hardware, Makers of.**  
Clapp, E. D. Mfg. Co., Auburn, N. Y.  
Covert's Saddlery Works, Farmer, N. Y.  
Eccles, Richard, Auburn, N. Y.  
Scranton Forging Co., Scranton, Pa.  
Smith, H. D. & Co., Plantsville, Conn.  
Wilcox & Howe, Birmingham, Conn.
- Cartridge Reloading Tools.**  
Ideal Mfg. Co., New Haven, Conn.
- Carvers' Tools.**  
White, Van Glahn & Co., 15-17 Chat ham Square, N. Y.
- Cash Tills.**  
Morford Register Co., Allentown, Pa.
- Casters, Wheel, &c.**  
Clark G. P., Windsor Locks, Conn.
- Castings, Iron and Steel.**  
Allentown Hdw. Wks. Allentown, Pa.  
Booth, The Lloyd Co., Youngstown, O.  
Boston Casting Co., So. Boston, Mass.  
The Burr & Houston Co., Brooklyn, N. Y.  
Cheney, S. & Son, Manlius, N. Y.  
Chester Steel Casting Co., Phila.  
Chrome Steel Works, Brooklyn, N. Y.  
Flagg, Stanley G. & Co., Phila.  
Garland Foundry Co., Cleveland, O.  
Haight & Clark, Albany, N. Y.  
Palmer & De Mooy Fdy. Co., Cleveland, O.  
Parsons, R. E. Co., Bridgeport, Conn.  
Pratt & Cady Co., Hartford, Conn.  
Sessions Foundry Co., Bristol, Conn.  
Shinkle, Harrison & Howard Iron Co., St. Louis, Mo.  
Spencer's S. Sons, Guilford, Conn.  
Standard Fdy. & Mfg. Co., Cleveland, O.  
Torrance Iron Co., Troy, N. Y.  
Union Lock & Hdw. Co., Lancaster, Pa.  
Walker Mfg. Co., Cleveland, Ohio.  
Wetherill, Robert & Co., Chester, Pa.  
Wiley, Crittenden & Co., Middletown, Conn.
- Castings, Malleable.**  
Arcade Malleable Iron Co., Worcester, Mass.  
Hammer & Co., Branford, Conn.  
Torrance Iron Co., Troy, N. Y.
- Catalogue Files.**  
Folding Paper Box Co., So. Bend, Ind.
- Chains.**  
Bradlee & Co., Philadelphia.  
Garland Chain Co., Rankin, Pa.  
Link Belt Engineering Co., Phila., Pa.  
McKay, Jas. & Co., Pittsburgh, Pa.
- Check Punch.**  
Hogson & Pettis Mfg. Co., New Haven, Conn.
- Chimneys.**  
Phila. Engineering Works, Phila., Pa.
- Chisels, Manufacturers of.**  
Buck Bros., Milbury, Mass.  
Buck, Chas., Milbury, Mass.  
White, L. & I. J. Co., Buffalo, N. Y.
- Chucks.**  
Cushman Chuck Co., Hartford, Conn.  
Leavitt Mch. Co., Orange, Mass.  
Skinner Chuck Co., New Britain, Conn.  
Smith & Egge Mfg. Co., Bridgeport.  
Union Mfg. Co., 103 Chambers, N. Y.  
Whitlock, Wm., 39 Cortlandt St., N. Y.  
Whitton, D. E. Mach. Co., New London, Conn.
- Clamps.**  
Hammer & Co., Branford, Conn.  
Le Count, O. W., So. Norwalk, Conn.
- Cleavers and Choppers.**  
Mason & Parker, Winchendon, Mass.  
Plumb, Fayette R., Phila., Pa.
- Clipping Machines.**  
Gillette Clipping Machine Co., 201 E. 23d Street, N. Y.
- Coal.**  
Barns, C. K. & Co., Philadelphia, Pa.  
Wister, Francis, Philadelphia, Pa.
- Cont and Hat Hooks.**  
Am. Wire Goods Co., Lowe, Mass.
- Coffee Mills.**  
Enterprise Mfg. Co., Phila., Pa.  
Parker, Chas. Co., Meriden, Conn.
- Coke.**  
Barns, C. K. & Co., Philadelphia, Pa.  
Houston, C. B. & Co., Philadelphia, Pa.  
Raney, W. F., Cleveland, O.  
Wister, Francis, Philadelphia, Pa.
- Collections.**  
Hardware Board of Trade (Limited), 4 & 6 Warren, N. Y.
- Condensers.**  
Worthington, Henry R., 86 & 88 Liberty Street, N. Y.
- Conveying Machinery.**  
Brown Hoisting & Conveying Machine Co., Cleveland, Ohio.  
Jeffrey Mfg. Co., Columbus, O.  
Link-Belt Engineering Co., Phila., Pa.
- Copper.**  
Ames Sword Co., Chicopee, Mass.  
Ansonia Brass & Copper Co., 19 and 21 Cliff, N. Y.  
Hendricks Bros., 49 Cliff, N. Y.  
New Haven Copper Co., 294 Pearl, N. Y.
- Randolph & Clowes, Waterbury, Conn.**  
Rome Brass & Copper Co., Rome, N. Y.  
Wister, Francis, Philadelphia, Pa.
- Copper, Sheet.**  
Cramp Metal Mfg. Co., Olney, Phila., Pa.
- Cordage.**  
Samson Cordage Works, Boston, Mass.
- Cork Screws.**  
Williamson, C. T. Wire Novelty Co., Newark, N. J.
- Corrugated Furnaces.**  
Continental Iron Wks., Brooklyn, N. Y.
- Corrugated Iron.**  
Cincinnati Corrugating Co., Piqua, O.  
Jersey City Galvanizing Co., 112 John St., N. Y.  
Moseley Iron Bridge & Roof Co., 5 Day, N. Y.  
N. Y. Iron Roofing & Corrugating Co., Jersey City, N. J.
- Counting Machines.**  
Durant, W. N., Milwaukee, Wis.
- Cranes.**  
Maris & Beekley, Philadelphia, Pa.  
Ridgway, Craig & Sons, Coatesville, Pa.  
Sellers, Wm. & Co., Inc., Phila., Pa.  
Whiting Foundry Equipment Co., Chicago, Ill.  
Yale & Towne Mfg. Co., Stamford, Ct.
- Cupolas, Hot Blast.**  
Whiting Foundry Equipment Co., Chicago, Ill.
- Curry Combs.**  
N. Y. Stamping Co., Brooklyn, N. Y.
- Cutlery, Importers of.**  
Sickles, Sweet & Lyon, 35 Barclay, N. Y.
- Cutlery, Manufacturers of.**  
Bingham, W. Co., Cleveland, Ohio.  
Dane, Stoddard & Kendall, Boston, Mass.  
Goodell Co., Antrim, N. H.  
Northampton Cutlery Co., Northampton, Mass.  
Wilson, John, Sheffield, England.
- Cutlery Display Cases.**  
Union Show Case Co., Chicago, Ill.
- Cyclometers.**  
Bridgeport Gun Implement Co., 313-315 Broadway, New York.
- Dies.**  
Wilson, J. Fred, Worcester, Mass.
- Die Forgings and Castings.**  
Bliss, E. W. Co., Brooklyn, N. Y.
- Door Checks and Springs.**  
Bardsley, J., 149 & 151 Baxter St., N. Y.  
Blount Mfg. Co., Boston, Mass.
- Drilling Machines.**  
Beaman & Smith, Providence, R. I.  
Bickford Drill & Tool Co., Cin., Ohio.  
Buffalo Forge Co., Buffalo, N. Y.  
Champion Blower & Forge Co., Lancaster, Pa.  
Dallett, Thos. H. & Co., Philadelphia.  
D'Amour & Littledale 204 E. 43d St., N. Y.  
Dietz, Schumacher & Co., Cincinnati, O.  
Dwight Slate Machine Co., Hartford, Conn.  
Goddard, Asa, Worcester, Mass.  
Halsey, Jas. T., Philadelphia, Pa.  
Hamilton Mch. Tool Co., Hamilton, O.  
Quint, A. D., Hartford, Conn.  
Sellers, Wm. & Co., Inc., Phila., Pa.  
Signourney Tool Co., Hartford, Conn.  
Silver Mfg. Co., Salem, O.  
Wiley & Russell Mfg. Co., Greenfield, Mass.
- Drills, Mine.**  
Rand Drill Co., 28 Park Place, New York
- Drop Forgings.**  
Billings & Spencer Co., Hartford, Conn.  
Boone, W. C. Mfg. Co., Boonton, N. J.  
Clapp, E. D. Mfg. Co., Auburn, N. Y.  
Eccles, Richard, Auburn, N. Y.  
Merrill Bros., Brooklyn, E. D.  
R. I. Tool Co., Providence, R. I.  
Scranton Forging Co., Scranton, Pa.  
Wilcox & Howe & Co., Birmingham, Conn.  
Wilmot & Hobbs Mfg. Co., Bridgeport, Conn.  
Wyman & Gordon, Worcester, Mass.
- Drop Presses.**  
Bliss, E. W. Co., Brooklyn, N. Y.  
Crosby, G. A. & Co., Chicago, Ill.  
Miner & Peck Mfg. Co., New Haven, Conn.  
Stiles & Parker Press Co., Brooklyn, N. Y.  
Vineyard Forge Works, Vineyard, N. J.  
Vulcan Iron Works, Chicago, Ill.  
Waterbury Farrel Foundry and Machine Co., Waterbury, Conn.
- Dumb Waiters.**  
Hutchinson, F. S. Co., 32 Warren St., N. Y.  
Storm Mfg. Co., Newark, N. J.
- Dynamite.**  
New York Powder Co., 62 Liberty St., N. Y.
- Dynamos.**  
C. & C. Electric Co., 402 and 404 Greenwich St., N. Y.  
Cutter, Wood & Stevens, Boston, Mass.
- Edge Tools, Makers of.**  
Buck Bros., Milbury, Mass.  
Buck, Chas., Milbury, Mass.  
Plumb, Fayette R., Philadelphia, Pa.  
White, L. & I. J. Co., Buffalo, N. Y.

- Egg Beaters.**  
North Bros. Mfg. Co., Philadelphia, Pa.
- Electric Bells and Supplies.**  
Ostrander, W. R. & Co., 204 Fulton St., New York.  
Wollensak, J. F., Chicago, Ill.
- Elevators, Makers of.**  
Link-Belt Engineering Co., Phila., Pa.  
Morse, Williams & Co., Phila., Pa.
- Emery and Emery Wheels.**  
Cutter, Wood & Stevens, Boston, Mass.  
Diamond Mach. Co., Providence, R. I.  
N. Y. Belting & Packing Co., Ltd., N. Y.  
Northampton Emery Wheel Co., Leeds, Mass.  
Norton Emery Wheel Co., Worcester, Mass.  
Sterling Emery Wheel Co., 174 Fulton St., N. Y.  
Tanite Co., Stroudsburg, Pa.
- Emery Wheel Dressers.**  
Bay State Stamping Co., Worcester, Mass.
- Engineers and Contractors.**  
Alken, Henry, Pittsburgh, Pa.  
Herrick, J. A., 284 Pearl St., N. Y.  
Kennedy, Julian, Pittsburgh, Pa.  
Laughlin, Alex. & Co., Pittsburgh, Pa.  
Lean, D. B., Co., Pittsburgh, Pa.  
McCure, Amsler & Co., Pittsburgh, Pa.  
Smythe, S. R. Co., Incorporated, Pittsburgh, Pa.  
Swindell, W. & Bros., Pittsburgh, Pa.
- Engines, Gas and Gasoline.**  
Buckeye Mfg. Co., Union City, Ind.  
Otto Gas Engine Works, Phila., Pa.  
Springfield Gas Engine Co., Springfield, O.
- Engines, Steam, Makers of.**  
Allis, E. P. Co., Milwaukee, Wis.  
Bass Foundry & Machine Works, Ft. Wayne, Ind.  
Fischer Fdry. & Mch. Co., Pittsburgh, Pa.  
Harris, Wm. A., Steam Engine Co., Providence, R. I.  
Norwalk Iron Works Co., So. Norwalk, Conn.  
Phila. Engineering Works, Phila., Pa.  
Southwark Foundry & Machine Co., Phila., Pa.  
Tod, William & Co., Youngstown, O.  
Totten & Hogg Iron & Steel Fdry. Co., Pittsburgh, Pa.  
Westwick, Jno. & Son, Galena, Ill.  
Wetherill, Robt. & Co., Chester, Pa.
- Excelsior.**  
Independent Electric Co., Chicago, Ill.
- Expansion Bolts.**  
Boone, W. C. Mfg. Co., Boonton, N. J.  
Church, Isaac, Toledo, O.  
Steward & Romaine Mfg. Co., Phila., Pa.
- Faucets, Self-Measuring.**  
Lane Bros., Poughkeepsie, N. Y.
- Faucets, Wooden, Makers of.**  
John Sommer's Son, Newark, N. J.
- Feed-Water Heaters and Purifiers.**  
Davis, I. B. & Son, Hartford, Conn.  
Harrison Safety Boiler Works, Phila., Pa.  
National Pipe Bending Co., New Haven, Conn.  
Taunton Locomotive Mfg. Co., Taunton, Mass.  
Webster, Warren & Co., Camden, N. J.  
Whitlock Coil Pipe Co., Elmwood, Conn.
- Fencing, Iron and Wire.**  
Barnum, E. T., Detroit, Mich.  
California Wire Works, San Francisco, Cal.  
Champion Iron Co., Kenton, O.  
Chess Bros., Pittsburgh, Pa.  
Clinton Wire Cloth Co., Clinton, Mass.  
Gilbert & Bennett Mfg. Co., 42 Cliff St., New York.  
Kilmer Mfg. Co., Newburgh, N. Y.  
The Van Dorn Iron Works Co., Cleveland, O.
- Files, Importers of.**  
Moss, F. W., 80 John St., N. Y.
- Files and Rasps, Manufacturers of.**  
Arcade File Works, Anderson, Ind.  
Banker & White, Troy, N. Y.  
Barnett, G. & H., 41 & 43 Richmond, Phila.  
McCauley File Co., Philadelphia.  
Nicholson File Co., Providence, R. I.
- Fire Brick, Makers of.**  
Borner, Cyrus, Philadelphia, Pa.  
Dover Fire Brick Co., Cleveland, O.  
Gardner, Jas. & Son, Cumberland, Md.  
Kreischer, B. & Sons, foot E. Houston St., N. Y.  
Maurer, H. & Son, 420 E. 23d, N. Y.  
Ostrander Fire Brick Co., Troy, N. Y.  
Valentine, M. D. & Bro. Co., Woodbridge.
- Fire Doors.**  
Coburn Trolley Track Mfg. Co., Holyoke, Mass.
- Fishing Tackle.**  
Dane, Stoddard & Kendall, Boston, Mass.
- Flint and Emery Paper.**  
Baeder, Adamson & Co., Phila., Pa.
- Fodder Cutters.**  
Silver Mfg. Co., Salem, O.
- Forges, Portable, &c.**  
Buffalo Forge Co., Buffalo, N. Y.  
Champion Blower & Forge Co., Lancaster, Pa.  
Sturtevant, B. F. Co., Boston, Mass.
- Forgings, Iron and Steel.**  
Bethlehem Iron Co., S. Bethlehem, Pa.  
Cambria Steel—Cambria Iron Co., Johnstown, Pa.  
Frankford Steel Co., Phila., Pa.  
Schantz Iron Works, Canton, Pa.  
U. S. Projectile Co., Brooklyn, N. Y.
- Forks, Hay and Manure.**  
Iowa Farming Tool Co., Ft. Madison, Iowa.  
Withington & Cooley Mfg. Co., Jackson, Mich.
- Foundry Facings.**  
Dixon, Jos., Crucible Co., Jersey City, N. J.  
S. Obermayer Co., Cincinnati, O.  
Smith's Pattern Works, Akron, Ohio.
- Foundry Riddles.**  
Estey, W. S., 65 Fulton, N. Y.
- Foundry Supplies.**  
S. Obermayer Co., Cincinnati, O.  
Rice Mfg. Co., New Durham, N. H.  
Smith, J. D., Fdy. Supply Co., Cin., O.  
Smith's Pattern Works, Akron, Ohio.
- Friction Clutches.**  
Brown, A. & F., 17 Day St., N. Y.  
Keystone Clutch & Mch. Wks., Phila., Pa.  
Moore & White Co., Philadelphia, Pa.
- Gages.**  
Leavitt Mch. Co., Orange, Mass.
- Galvanized Material.**  
Jersey City Galvanizing Co., 112 John St., N. Y.
- Galvanizing and Tinning.**  
Wilcox, Crittenden & Co., Middletown, Conn.
- Gas Producers.**  
Wood, R. D. & Co., Philadelphia, Pa.
- Gas & Steam Fitters' Supplies.**  
Pancoate, Henry B. & Co., Phila., Pa.
- Gear Cutters.**  
D. E. Whiton Mach. Co., New London, Ct.
- Gears.**  
Boston Gear Works, Boston, Mass.  
Gleason Tool Co., Rochester, N. Y.  
Lincoln Iron Works, Rutland, Vt.  
Poole, Robt. & Son Co., Baltimore, Md.  
U. S. Projectile Co., Brooklyn, N. Y.
- Glass Boards.**  
Lufkin Rule Co., Saginaw, Mich.
- Glass Cutters.**  
Monce, S. G., Bristol, Conn.
- Glaziers' Points.**  
Shelton Co., Birmingham, Conn.
- Glue.**  
Baeder, Adamson & Co., Phila., Pa.  
Dodd, A. W. & Co., Gloucester, Mass.  
Russia Cement Co., Gloucester, Mass.
- Grinding and Polishing Machines.**  
Cutter, Wood & Stevens, Boston, Mass.  
Diamond Mach. Co., Providence, R. I.  
Norton Emery Wheel Co., Worcester, Mass.
- Grindstone Dressing Machinery.**  
Blake & Johnson, Waterbury, Conn.
- Grindstones.**  
Cleveland Stone Co., Cleveland, O.  
Grafton Stone Co., Grafton, Ohio.
- Gunpowder, Makers of.**  
Lafin & Rand Powder Co., 29 Murray St., N. Y.
- Gymnasium Supplies.**  
Independent Electric Co., Chicago, Ill.
- Hammocks.**  
Palmer, I. E., Middletown, Conn.
- Handles.**  
Cleveland Wood Turning Co., Cleveland, O.
- Hangers, Door.**  
Coburn Trolley Track Mfg. Co., Holyoke, Mass.  
Lane Bros., Poughkeepsie, N. Y.
- Hardware Comm'n Merchants.**  
Jacobus, W. H., 90 Chambers, N. Y.
- Hardware Drawers.**  
Wernicke Co., Minneapolis, Minn.
- Hardware Jobbers.**  
White, Van Ghann & Co., 15-17 Chatham Square, N. Y.
- Hardware Manufacturers.**  
Allentown Hardware Works, Allentown, Pa.  
Covert Mfg. Co., West Troy, N. Y.  
Miller Falls Co., 93 Reade St., N. Y.  
Parker, Chas. Co., Meriden, Conn.  
Stearns, E. C. & Co., Syracuse, N. Y.  
Streeter, N. R. & Co., Groton, N. Y.  
Supply Hdq. Co., Phila., Pa.  
Union Mfg. Co., 103 Chambers, N. Y.  
Yale & Towne Mfg. Co., Stamford, Ct.
- Hardware Mfrs. Agents.**  
Bingham, W. Co., Cleveland, O.  
Graham, John H. & Co., 113 Chambers  
Sickles, Sweet & Lyon, 35 Barclay, N. Y.
- Hardware Specialties.**  
Acme Shear Co., Bridgeport, Conn.  
Berger Bros., Philadelphia, Pa.  
Enterprise Mfg. Co., Philadelphia, Pa.  
Johnson, S. C., Racine, Wis.
- Hollow Ware.**  
Avery Stamping Co., Cleveland, O.  
Bronson Supply Co., Cleveland, Ohio.  
Cleveland Stamping & Tool Co., Cleveland, O.
- Hollow Ware, Aluminum.**  
Wohler Aluminum Co., Chicago, Ill.
- Horse Clippers.**  
Gillette Clipping Machine Co., 201 E. 23d St., N. Y.
- Horse Nails, Makers of.**  
Capwell Horse Nail Co., Hartford, Ct.  
National Horse Nail Co., Vergennes, Vt.  
Putnam Nail Co., Neponset, Boston, Mass.
- Horse and Mule Shoes, Makers of.**  
Bryden Horse Shoe Co., Catsauqua, Pa.  
Burden Iron Co., Troy, N. Y.  
Crescent Horse Shoe & Iron Co., Max Meadows, Va.  
Leonard, J., 446 West St., N. Y.  
Old Dominion Iron & Nail Works Co., Richmond, Va.  
Phoenix Horse Shoe Co., Poughkeepsie, N. Y.  
Rhode Island Perkins Horse Shoe Co., Providence.  
Shoenberger & Co., Pittsburgh, Pa.  
Standard Horse Shoe Co., Boston, Mass.
- Hose.**  
N. Y. Belting & Packing Co., Ltd., 15 Park Row, N. Y.
- Hose Coupler.**  
Adams & Westlake Co., Chicago, Ill.
- Hydrants, &c.**  
McLean, John, 298 & 298 Monroe, N. Y.
- Hydraulic Forging.**  
U. S. Projectile Co., Brooklyn, N. Y.
- Hydraulic Jacks.**  
Dudgeon, Richard, 24 Columbia, N. Y.  
McCoy, Jos. F. Co., 28 Warren St., N. Y.
- Ice Cream Freezers.**  
Clement & Dunbar, Phila., Pa.  
White Mountain Freezer Co., Nashua, N. H.
- Injectors.**  
Eynon-Evans Mfg. Co., Philadelphia, Pa.  
Jenkins Bros., New York.
- Insurance, Boiler.**  
Hartford Steam Boiler Inspection & Insurance Co., Hartford, Conn.
- Iron and Steel, Swedish.**  
Lundberg, Gustaf, Boston, Mass.  
Milne, A. & Co., 1 Broadway, N. Y.
- Iron Commission Brokers.**  
Butze, Adolph, St. Louis, Mo.  
Corning, Edw. & Co., 29 B'way, N. Y.  
Cotton, Barclay W. & Co., Phila.  
Etting, Edw. J., Philadelphia.  
Hogan, John L. & Co., Philadelphia, Pa.  
Hoffman, J. W. & Co., Philadelphia.  
Loria, Henry & Co., Philadelphia.  
Keely, Jerome & Co., Philadelphia.  
Lea, J. Tatum & Co., Philadelphia.  
Mohr, J. J., 430 Walnut, Philadelphia.  
Pilling & Crane, Philadelphia, Pa.  
Wister, L. & R. Co., Phila., Pa.
- Iron Ore.**  
Samuel, Frank, Philadelphia, Pa.
- Iron, Merchants.**  
Barns, C. K. & Co., Philadelphia, Pa.  
Borden & Lovell, 70 West, N. Y.  
Corning, Edw. & Co., 29 B'way, N. Y.  
Cox, Justice, Jr., Philadelphia.  
Cotton, Barclay W. & Co., Phila.  
Cuniffe, R. M., Phila., Pa.  
Hoffman, J. W. & Co., Philadelphia.  
Leonard, J., 446 West St., N. Y.  
Nicolls, Wheeler & Co., Philadelphia.  
Ogden & Wallace, 577 to 583 Greenwich St., N. Y.  
Pierston & Co., 29 Broadway, N. Y.  
Thomson, W. H. & Co., Phila., Pa.  
Wallace, Wm. E. & Co., 29 B'way, N. Y.  
Whitney, A. R. & Co., 17 B'way, N. Y.  
Wilson, E. H. & Co., Philadelphia.
- Iron, Importers.**  
Abbott, Wheelock & Co., N. Y. and Boston  
Lundberg, Gustaf, Boston, Mass.
- Iron, Sheet, Manufacturers of.**  
Cambridge Iron & Steel Co., Cambridge, Ohio.  
W. Dewees Wood Co., Lim., McKeesport, Pa.
- Ironwork, Ornamental.**  
Barnum, E. T., Detroit, Mich.  
Champion Iron Co., Kenton, O.  
Ludlow-Saylor Wire Co., St. Louis, Mo.  
The Van Dorn Iron Works Co., Cleveland, O.
- Japanning.**  
Smith, Theo. V., 54 John St., N. Y.
- Keys.**  
Wollensak, J. F., Chicago, Ill.
- Knife and Tool Grinders.**  
Tracy, A. J. Co., Ltd., 18 Cliff St., N. Y.
- Ladles.**  
Whiting Fdy. Equipment Co., Chicago, Ill.
- Lanterns.**  
Steam Gauge & Lantern Co., Syracuse, N. Y.
- Lasts.**  
Brandenburg & Co., Chicago, Ill.  
Kupferle, Jno. C., St. Louis, Mo.
- Lathes.**  
Beaman & Smith, Providence, R. I.  
Dietz, Schumacher & Co., Cincinnati, O.  
Draper Machine Tool Co., Worcester, Mass.  
Harrington, E. Son & Co., Phila., Pa.  
Johnson, Israel H. Jr., & Co., Phila., Pa.  
Jones & Lamson Mch. Co., Springfield, Vt.  
New Haven Mfg. Co., New Haven, Conn.  
Rhodes, L. E. Co., Hartford, Conn.  
Sebastian Lathe Co., Cincinnati, O.  
Seneca Falls Mfg. Co., Seneca Falls, N. Y.
- Lathing, Expanded Metal.**  
Chess Bros., Pittsburgh, Pa.
- Lathing, Wire.**  
Clinton Wire Cloth Co., Clinton, Mass.  
N. J. Wire Cloth Co., Trenton, N. J.  
Wright & Colton Wire Cloth Co., Worcester, Mass.
- Lawn Mowers.**  
Blair Mfg. Co., Springfield, Mass.  
Chadborn & Coldwell Mfg. Co., Newburgh, N. Y.  
Coldwell Lawn Mower Co., Newburgh, N. Y.  
Dille & McGuire Mfg. Co., Richmond, Ind.  
F. & N. Mfg. Co., Richmond, Ind.  
Henley, M. C., Richmond, Ind.
- Lawn Rakes.**  
Gibbs Mfg. Co., Canton, Ohio.  
Kohler, F. E. & Co., Canton, O.
- Lawn Sprinklers.**  
Blair Mfg. Co., Springfield, Mass.  
McGowan, John H., Cincinnati, O.  
Pleuger & Henger Mfg. Co., St. Louis, Mo.
- Letters and Figures, Metallic.**  
White, A. A. & Co., Providence, R. I.
- Letters, Paper.**  
Tablet & Ticket Co., Chicago, Ill.
- Levels.**  
Richardson, C. F. & Son, Athol, Mass.
- Locks and Knobs, Manufacturers of.**  
Deitz, A. E., 97 Chambers, N. Y.  
Reading Hdq. Co., Reading, Pa.  
Smith & Egge Mfg. Co., Bridgeport, Ct.  
Yale & Towne Mfg. Co., Stamford, Ct.
- Lubricants.**  
Dixon, Jos., Crucible Co., Jersey City, N. J.
- Machinery.**  
Am. Tool Works, Cleveland, Ohio.  
Ayer, H. C. & Gleason Co., Phila., Pa.  
Barnes, W. F. & John, Rockford, Ill.  
Beaman & Smith, Providence, R. I.  
Bement, Miles & Co., Philadelphia, Pa.  
Bigelow, C. E., 45 Day, N. Y.  
Bignall & Keeler Mfg. Co., St. Louis.  
Bliss, E. W. Co., Brooklyn, N. Y.  
Briggs, Marvin, 12 Broadway, N. Y.  
Bullard Mch. Tool Co., Bridgeport, Ct.  
Carlin's Sons, Thos., Allegheny, Pa.  
Clapp, Geo. M., age, 74 Cortlandt, N. Y.  
Cross & Speirs Mch. Co., Waterbury, Conn.  
Detrick & Harvey Mch. Co., Baltimore, Md.  
Dietz, Schumacher & Co., Cincinnati, Ohio.  
Fitchburg Mch. Works, Fitchburg, Mass.  
Garvey Mch. Co., Light & Canal Sts.  
Gould & Eberhardt, Newark, N. J.  
Hamilton Mch. Tool Co., Hamilton, O.  
Harrington, E. Son & Co., Phila., Pa.  
Hartford Machine Screw Co., Hartford, Conn.  
Hendey Machine Co., Torrington, Ct.  
Hill, Clarke & Co., Boston, Mass.  
Howard & Morse, 45 Fulton St., N. Y.  
Johnson, Israel H. Jr., & Co., Phila.  
Jones & Lamson Mch. Co., Springfield, Vt.  
Lodge & Davis Mch. Tool Co., Cincinnati, O.  
Lodge & Shipley Mch. Tool Co., Cincinnati, O.  
McCabe, J. J., 68 Cortlandt, N. Y.  
Machinists' Supply Co., Rochester, N. Y.  
Manville, E. J., Mch. Co., Waterbury, Conn.  
Newark Mch. Tool Wks., Newark, N. J.  
New Haven Mfg. Co., New Haven, Conn.  
New York Machinery Depot, 178 Broadway, New York.  
Niles Tool Wks., 138 Liberty St., N. Y.  
Pittsburgh Mfg. Co., Pittsburgh, Pa.



Place, Geo., 145 Broadway, N. Y.  
 Pond, L. W. Mch. Co., Worcester, Mass.  
 Poole, Robt. & Son Co., Baltimore, Md.  
 Powell Planer Co., Worcester, Mass.  
 Prentiss Tool & Supply Co., N. Y.  
 Scranton Supply & Mchry. Co., Scranton, Pa.  
 Sellers, Wm. & Co., Phila.  
 Seyfer's Sons, L. F., Philadelphia, Pa.  
 Sigmund Tool Co., Hartford, Conn.  
 Steptoe, J. & Co., Cincinnati, O.  
 Stow Flexible Shaft Co., Ltd., Phila.  
 Toomey, Frank, Philadelphia, Pa.  
 Walker Mfg. Co., Cleveland, O.  
 Wetherill, Robert & Co., Chester, Pa.  
 Wilson, W. A., Rochester, N. Y.

#### Machinery for Hardware Manufacturers.

Adt, Jno. & Son, New Haven, Conn.

#### Machine Knives.

Loring Coes & Co., Worcester, Mass.  
 Simonds Mfg. Co., Fitchburg, Mass.

#### Machine Screws.

American Iron & Bolt Co., Cincinnati, Ohio.  
 Bubbell, Harvey, Bridgeport, Ct.  
 New Britain Hdw. Mfg. Co., New Britain, Conn.  
 Rhode Island Tool Co., Providence, R. I.

#### Machine Tools.—See Machinery.

#### Machinists' Scales.

Coffin & Leighton, Syracuse, N. Y.  
 Starrett, L. S. Co., Athol, Mass.

#### Machinists' Tools and Supplies.

King, J. M. & Co., Waterford, N. Y.  
 Sellers, Wm. & Co., Inc., Phila.

#### Manufacturing Sites.

Chicago, Milwaukee & St. Paul R. R., Chicago, Ill.

#### Measuring Tapes.

Lufkin Rule Co., Saginaw, Mich.

#### Meat Choppers.

Enterprise Mfg. Co., Philadelphia, Pa.

#### Meat Cutters.

North Bros. Mfg. Co., Philadelphia, Pa.

#### Mechanical Instruction.

Correspondence School of Mechanics, Scranton, Pa.

#### Metals.

Fearing, Wm. S., 100 Chambers, N. Y.  
 Hendricks Bros., 49 Cliff, N. Y.

#### Metal Brokers.

American Metal Co., N. Y.

#### Metal Saws.

Q. & C. Co., Chicago, Ill.

#### Metallurgists.

Britton, J. Blodgett, Phila., Pa.

#### Mining Knives.

Palmer Hdw. Mfg. Co., Troy, N. Y.  
 Streeter, N. R. & Co., Groton, N. Y.

#### Mine Lamps.

Darby, Edw. & Sons, Phila., Pa.  
 Leonard, B. E., Scranton, Pa.  
 Snyder, J. L., Plymouth, Pa.

#### Mining Machinery.

Rand Drill Co., 23 Park Place, N. Y.

#### Mining Screens.

Harrington & King Perforating Co., Chicago, Ill.  
 Howard & Morse, 45 Fulton, N. Y.

#### Mining Machinery.

Allis, E. P. Co., Milwaukee, Wis.

#### Models, Makers of.

Ideal Machine Works, Hartford, Conn.

#### Molding Sand.

Obermayer, S. Co., Cincinnati, O.

#### Motors, Water and Electric.

O. & C. Electric Co., 402 and 404 Greenwich St., N. Y.  
 Dallett, Thomas H. & Co., Phila., Pa.

#### Nail Machinery.

Pittsburgh Mfg. Co., Pittsburgh, Pa.

#### Nail and Tack Pullers.

Am. Specialty Co., Hartford, Conn.  
 Scranton & Co., New Haven, Conn.

#### Nails (Cut) and Spikes.

Borden & Lovell, 70 West, N. Y.  
 Pottstown Iron Co., Pottstown, Pa.  
 Riverside Iron Wks., Wheeling, W. Va.

#### Norway Shapes, Rollers of.

Rowland, William & Harvey, Frankford, Philadelphia.

#### Novelty Manufacturers.

Ideal Machine Works, Hartford, Conn.

#### Nut Machines.

Dunham Nut Co., Unionville, Ct.

#### Nuts, Bolts, &c., Makers of.

American Bolt Co., Lowell, Mass.  
 American Iron & Bolt Co., Cincinnati, Ohio.  
 American Screw Co., Providence, R. I.  
 Blake & Johnson, Waterbury, Conn.  
 Dunham Nut Co., Unionville, Conn.  
 Haskell, Wm. H. Co., Pawtucket, R. I.  
 Mt. Carmel Bolt Co., Mt. Carmel, Conn.  
 Pennsylvania Bolt & Nut Co., Lebanon, Pa.  
 Port Chester Bolt & Nut Co., Port Chester, N. Y.  
 Rhode Island Tool Co., Providence, R. I.  
 Russell, Burdall & Ward, Port Chester, N. Y.  
 Sternbergh, J. H. & Son, Reading, Pa.  
 Wilson, J. Fred., Worcester, Mass.  
 Wm. H. Haskell Co., Pawtucket, R. I.

#### Offers.

Wilmot & Hobbs Mfg. Co., Bridgeport, Conn.

#### Oilless Anti-Friction Metals.

North American Metalline Co., Long Island City, N. Y.

#### Oil Cans.

Bloomsburg Mfg. Co., Bloomsburg, Pa.

#### Oil Stones.

Pike Mfg. Co., Pike Station, N. H.

#### Ores.

Wister, Francis, Philadelphia, Pa.

#### Ox Shoes.

Scranton Forging Co., Scranton, Pa.

#### Packing.

Morrison, Robert, St. Louis, Mo.  
 N. Y. Belting & Packing Co., Ltd., N. Y.

#### Padlocks.

Ames Sword Co., Chicopee, Mass.  
 Fralm, E. T., Lancaster, Pa.  
 Union Lock & Hdw. Co., Lancaster, Pa.

#### Pails.

Richmond Cedar Wks., Richmond, Va.

#### Paint Burners.

Dangler Stove & Mfg. Co., Cleveland, Ohio.

#### Paint Cans.

Wilmot & Hobbs Mfg. Co., Bridgeport, Conn.

#### Pants Stretcher.

Covert Mfg. Co., West Troy, N. Y.

#### Patent Solicitors.

Butler, C. N., Phila., Pa.  
 Jenner, H. W. T., Washington, D. C.  
 Howson & Howson, Philadelphia and Washington.  
 Stocking, E. B., Washington, D. C.

#### Pattern Letters.

Wells, Heber, 157 William St., N. Y.

#### Perforated Metal.

Clinton Wire Cloth Co., Clinton, Mass.  
 Harrington & King Perforating Co., Chicago, Ill.  
 Hendrick Mfg. Co., Ltd., Carbondale, Pa.

#### Phosphor Bronze.

Phosphor Bronze Smelting Co., Limited, Philadelphia.

#### Phosphor Tin.

Crescent Phosphorized Metal Co., Philadelphia, Pa.  
 Halk & Naumann, 516 Pearl, N. Y.

#### Pig Iron.

Houston, C. B. & Co., Philadelphia, Pa.  
 Montour Iron & Steel Co., Danville, Pa.  
 Naylor & Co., 45 Wall, N. Y.  
 Phillips & Crane, Philadelphia, Pa.  
 Samuel, Frank, Philadelphia, Pa.

#### Pig Iron Storage.

Am. Pig Iron Storage Warrant Co., 41 Wall, N. Y.

#### Pile Drivers.

Vulcan Iron Works, Chicago, Ill.

#### Pipe, Bent.

National Pipe Bending Co., New Haven, Conn.

#### Pipe Cutting and Threading Machines.

Armstrong Mfg. Co., Bridgeport, Conn.  
 Bignall & Keeler Mfg. Co., St. Louis, Mo.  
 Detrick & Harvey Mch. Co., Baltimore, Md.  
 Merrill Mfg. Co., Toledo, O.  
 Pancoast, Henry B. & Co., Phila.  
 Saunders Sons, D., Yonkers, N. Y.  
 Walworth Mfg. Co., Boston, Mass.

#### Pipe Grips.

Prentiss Vise Co., 44 Barclay, N. Y.

#### Pipes, Fittings, &c., Makers of.

McNab & Harlin Mfg. Co., N. Y.

#### Pipe, Sewer.

Columbus Sewer Pipe Co., Columbus, Ohio.

#### Pipe, Water and Gas, Makers of.

Donaldson Iron Co., Emaus, Pa.  
 Riverside Iron Works, Wheeling, W. Va.  
 Wood, R. D. & Co., Philadelphia, Pa.

#### Plane Irons, Manufacturers of.

Buck Bros., Millbury, Mass.  
 Buck, Chas., Millbury, Mass.

#### Planers.

Detrick & Harvey Mch. Co., Baltimore, Md.  
 New Haven Mfg. Co., New Haven, Conn.  
 Fond, L. W. Mch. Co., Worcester, Mass.  
 Powell Planer Co., Worcester, Mass.  
 Wilson, W. A., Worcester, Mass.

#### Planes, Manufacturers of.

Stanley Rule & Level Co., N. Y.

#### Plated Ware.

Boardman, L. & Son, New Haddam, Ct.  
 Holmes & Edwards Silver Co., Bridgeport, Conn.  
 Rogers, Wm. Mfg. Co., Hartford, Ct.

#### Plate, Iron and Steel, Mfrs. of.

Aetna-Standard Iron & Steel Co., Bridgeport, O.  
 Lukens Iron & Steel Co., Coatesville, Pa.  
 Mahoning Valley Iron Co., Youngstown, Ohio.  
 McIlvain & Sons, Reading, Pa.  
 Pottstown Iron Co., Pottstown, Pa.  
 Pottsville Iron & Steel Co., Pottsville, Pa.

Singer, Nimick & Co., Pittsburgh, Pa.  
 The Mahoning Valley Iron Co., Youngstown, O.  
 Wood, Alan Co., Philadelphia.

#### Plating, Nickel, Brass and Silver.

Wilmot & Hobbs Mfg. Co., Bridgeport, Conn.

#### Polishing Machines.

Watson & Stillman, 204 E. 42d, N. Y.

#### Post Hole Diggers.

Gibbs Mfg. Co., Canton, Ohio.

Kohler, F. E. & Co., Canton, O.

#### Pot Covers.

Shepard, Sidney & Co., Buffalo, N. Y.

#### Poultry Nettings.

Barnum, E. T., Detroit, Mich.  
 Gilbert & Bennett Mfg. Co., 42 Cliff St., N. Y.

N. J. Wire Cloth Co., Trenton, N. J.

Tyler Wire Works Co., W. S., Cleveland, O.

Wright & Colton Wire Cloth Co., Worcester, Mass.

#### Powder.

Lafin & Rand Powder Co., 29 Murray, New York Powder Co., 62 Liberty St., N. Y.

#### Power Hammers.

Dienelt & Eisenhardt, Philadelphia.  
 Dupont Mfg. Co., St. Johnsbury, Vt.  
 Jenkins & Lingle, Bellefonte, Pa.  
 Long & Allstatter Co., Hamilton, Ohio.  
 Miner & Peck Mfg. Co., New Haven, Conn.  
 Scranton & Co., New Haven, Conn.

#### Power Transmitting Machinery.

Dodge Mfg. Co., Mishawaka, Ind.

#### Presses, Dies, &c.

E. W. Bliss Co., Brooklyn, N. Y.  
 Crosby, G. A. & Co., Chicago, Ill.  
 Stiles & Parker Press Co., Brooklyn, N. Y.  
 Waterbury Mch. Co., Waterbury, Ct.

#### Presses, Power, Makers of.

Bliss, E. W. Co., Brooklyn, N. Y.  
 Manville, E. J. Mch. Co., Waterbury, Ct.  
 Merriman, A. H., Meriden, Conn.  
 Waterbury Farrel Foundry & Machine Co., Waterbury, Conn.

#### Printing and Embossing.

Griffith, Axtell & Cady Co., Holyoke, Mass.

#### Pruners.

Topfiff & Ely Co., Elyria, Ohio.

#### Pulleys.

Brown, A. & F., 17 Dey St., N. Y.  
 Dodge Mfg. Co., Mishawaka, Ind.  
 Keystone Clutch Mch. Wks., Phila., Pa.  
 Reading Wood Pulley Co., Reading, Pa.

#### Pumping Machinery.

Dean Bros. Steam Pump Works, Indianapolis, Ind.  
 Gouds Mfg. Co., Seneca Falls, N. Y.  
 Hooker-Collville Steam Pump Co., St. Louis, Mo.  
 McGowan, J. H. & Co., Cincinnati, O.  
 Maslin, J. & Son, Jersey City, N. J.  
 Norwalk Iron Works Co., So. Norwalk, Conn.  
 Southwick Fdy. & Mch. Co., Phila., Pa.  
 Valley Pump Works, Easthampton, Mass.  
 Worthington, Henry R., 86 and 88 Liberty St., N. Y.

#### Pump Leathers.

Detroit Valve & Washer Co., Detroit, Mich.

#### Pumps, Makers of.

Deming Co., Salem, O.  
 Douglas, W. & B., Middletown, Conn.  
 Gouds Mfg. Co., Seneca Falls, N. Y.  
 Myers, F. E. & Bro., Ashland, O.

#### Punches.

Richards, I. P., Providence, R. I.

#### Punches and Shears, Hand and Power.

E. W. Bliss Co., Brooklyn, N. Y.  
 Butts & Ordway, Boston, Mass.  
 Crosby, G. A. & Co., Chicago, Ill.  
 Long & Allstatter Co., Hamilton, Ohio.  
 Stiles & Parker Press Co., Brooklyn, N. Y.  
 Waterbury Farrel Foundry & Machine Co., Waterbury, Conn.  
 Watson & Stillman, 204 E. 42d, N. Y.

#### Rails, Old and New.

Perry, W. H. & Co., Providence, R. I.

#### Rat and Mouse Traps.

Estey, W. S., 65 Fulton, N. Y.  
 Excelsior Cutlery Co., Worcester, Mass.

#### Razors, Manufacturers of.

Millbury Razor Co., Millbury, Mass.

#### Reducing Valves.

D'Este & Seeley Co., Boston, Mass.

#### Reels.

Hendryx, A. B. Co., New Haven, Conn.

#### Refrigerators.

Wisconsin Refrigerator Co., Eau Claire, Wis.

#### Rivets.

Blake & Johnson, Waterbury, Conn.  
 Burden Iron Co., Troy, N. Y.  
 Cobb & Drew, Plymouth, Mass.  
 Dover Iron Co. of N. J., Dover, N. J.  
 Starbergh, J. H. & Son, Reading, Pa.  
 Townsend, W. P. & Co., New Brighton, Pa.

#### Riveting Machines.

Adt, Jno. & Sons, New Haven, Conn.

#### Rolling Mill Machinery.

Birmingham Iron Fdry, Birmingham, Conn.  
 Booth, The Lloyd Co., Youngstown, O.

Leechburg Foundry & Mch. Co., Pittsburgh, Pa.

Morgan Construction Co., Worcester, Mass.

Robinson-Rea Mfg. Co., Pittsburgh.

Totten & Hogg Iron and Steel Fdry. Co., Pittsburgh, Pa.

Trethewey Mfg. Co., Pittsburgh, Pa.

Waterbury Farrel Foundry & Mch. Co., Waterbury, Conn.

#### Rolls, Chilled, Sand and Steel.

Birmingham Iron Foundry, Birmingham, Conn.

Booth, The Lloyd Co., Youngstown, O.

East Chicago Fdry Co., Chicago, Ill.

Garrison, A. Fdry. Co., Pittsburgh, Pa.

Robinson-Rea Mfg. Co., Pittsburgh, Pa.

Seaman, Sleeth & Black, Pittsburgh.

Totten & Hogg Iron and Steel Fdry. Co., Pittsburgh, Pa.

#### Roofing.

Cincinnati Corrugating Co., Piqua, O.

N. Y. Iron Roofing & Corrugating Co., Jersey City, N. J.

#### Rope and Web Goods.

Covert Mfg. Co., West Troy, N. Y.

Covert's Saddle Wks., Farmer, N. Y.

#### Rope Wheels.

Cresson, Geo. V. Co., Philadelphia, Pa.

#### Rubber Goods.

Canfield, H. O., Bridgeport, Conn.

#### Rules, Manufacturers of.

Stanley Rule & Level Co., 29 Chambers, Stephens & Co., Riverton, Conn.

#### Sad Irons.

Enterprise Mfg. Co., Phila., Pa.

Streeter, N. R. & Co., Groton, N. Y.

#### Sand Paper.

Baeder, Adamson & Co., Phila., Pa.

#### Sap Spouts.

Stelle, Chas. C., Brooklyn, N. Y.

#### Sash Balances.

Caldwell Mfg. Co., Rochester, N. Y.

Pullman Sash Balance Co., Rochester, N. Y.

**Allentown Rolling Mill,** Allentown, Pa.  
**Lockhart Iron & Steel Co.,** Pittsburgh, Pa.  
**Passaic Rolling Mill Co.,** Paterson, N.J.  
**The Phoenix Iron Co.,** Phila., Pa.  
**Pottsville Iron & Steel Co.,** Pottsville, Pa.  
**Roberts, A. & P. & Co.,** Phila., Pa.  
**Tudor Iron Works,** St. Louis, Mo.

**Shears and Scissors.**  
**Acme Shear Co.,** Bridgeport, Conn.  
**Clauss Shear Co.,** Fremont, Ohio.  
**Heinrichs, R. Sons Co.,** Newark N. J.

**Sheet Iron and Steel, Manufacturers of.**  
**Etna-Standard Iron and Steel Co.,** Bridgeport, O.  
**Cambridge Iron & Steel Co.,** Cambridge, Ohio.  
**Jersey City Galvanizing Co.,** 112 John St., N. Y.  
**Mahoning Valley Iron Co.,** Livingston, Ohio.  
**Pierson & Co.,** 29 Broadway, N. Y.  
**Singer, Nimick & Co., Ltd.,** Pittsburgh, Pa.  
**The Mahoning Valley Iron Co.,** Youngstown, O.  
**Alan Wood Co.,** Philadelphia.  
**W. Dewees Wood Co.,** McKeesport, Pa.

**Sheet Metal Goods.**  
**Bloomsburg Mfg. Co.,** Bloomsburg, Pa.

**Sheet Zinc.**  
**Matthiessen & Hegeler Zinc Co.,** La Salle, Ill.

**Shell Brackets.**  
**Atlas Mfg. Co.,** New Haven, Conn.

**Shoe Stands.**  
**Kupferle, Jno. C.,** St. Louis, Mo.

**Show Cases.**  
**Union Show Case Co.,** Chicago, Ill.

**Sinks.**  
**Douglas, W. & B.,** Middletown, Conn.

**Skate Grinding Machinery.**  
**Perkins, Chas.,** Bridgewater, Mass.

**Skates, Ice.**  
**Dame, Stoddard & Kendall,** Boston, Mass.  
**Supplee Hardware Co.,** Phila., Pa.  
**Winslow, Sam'l, Skate Mfg. Co.,** Worcester, Mass.

**Skates, Roller.**  
**Henley, M. C.,** Richmond, Ind.  
**Winslow, Sam'l, Skate Mfg. Co.,** Worcester, Mass.

**Smelting Works.**  
**Reeves, Paul S.,** 760 S. Broad, Phila.

**Soldering Coppers.**  
**Clendenin Bros.,** Baltimore, Md.  
**Covert Mfg. Co.,** West Troy, N. Y.

**Speaking Tubes.**  
**Ostrander, W. R. & Co.,** 204 Fulton St., N. Y.  
**Wollensak, J. F.,** Chicago, Ill.

**Spelter.**  
**Matthiessen & Hegeler Zinc Co.,** La Salle, Ill.

**Spoons and Forks.**  
**Boardman, L. & Son,** New Haddam, Conn.  
**Holmes & Edwards Silver Co.,** Bridgeport, Conn.  
**Rogers, The Wm. Mfg. Co.,** Hartford, Conn.

**Sporting Goods.**  
**Hartley & Graham,** 312-315 B'way, N. Y.

**Spring.**  
**Coiled Wire Belting Co.,** Jersey City, N. J.  
**Dunbar Bros.,** Bristol, Conn.  
**Miller & Van Winkle,** Brooklyn, N. Y.  
**Morgan Spring Co.,** Worcester, Mass.  
**Roland, Wm. & Harvey,** Phila., Pa.  
**Sabin Machine Co.,** Montpelier, Vt.  
**Tuck Mfg. Co.,** Brockton, Mass.  
**Washburn & Moen Mfg. Co.,** Worcester, Mass.  
**Wolff, R. H. & Co., Ltd.,** 118th St. and Harlem River, N. Y.

**Spring Hinges.**  
**Bommer Bros.,** Brooklyn, N. Y.  
**Pullman Sash Balance Co.,** Rochester, N. Y.  
**Stover Mfg. Co.,** Freeport, Ill.  
**Van Wagoner & Williams Hdw. Co.,** 14 Warren St., N. Y.

**Stamping Works.**  
**Avery Stamping Co.,** Cleveland, O.  
**Cleveland Stamping & Tool Co.,** Cleveland, O.

**Staples.**  
**Cobb & Drew,** Plymouth, Mass.  
**Titchener, E. H. & Co.,** Binghamton, N. Y.

**Steam Gauges.**  
**Bristol Co.,** Waterbury, Conn.  
**Star Brass Mfg. Co.,** Boston, Mass.

**Steam Hammers, &c., Makers of.**  
**Dienelt & Eisenhardt,** Philadelphia.  
**Dudgeon, Richard,** 24 Columbia Street, N. Y.  
**Trethewey Mfg. Co.,** Pittsburgh, Pa.

**Steam Heating & Oil Separators.**  
**Webster, Warren & Co.,** Camden, N. J.

**Steam Separators.**  
**Harrison Safety Boiler Wks.,** Phila., Pa.  
**Webster, Warren & Co.,** Camden, N. J.

**Steam Specialties.**  
**D'Este & Seelye Co.,** Boston, Mass.  
**Lunkenheimer Co.,** Cincinnati, O.

**Steam Traps.**  
**D'Este & Seelye Co.,** Boston, Mass.

**Steel, Cold Rolled Strip.**  
**Superior Steel Co.,** Pittsburgh, Pa.  
**Wilnot & Hobbs Mfg. Co.,** Bridgeport, Conn.

**Steel Figures and Alphabet.**  
**Hoeng, C. W.,** 52 Fulton St., N. Y.  
**Ness, Geo. M., Jr.,** 61 Fulton St., N. Y.

**Steel Importers.**  
**Abbott, Wheelock & Co.,** N. Y. and Boston.  
**Hobson, Francis, Seaman & Co.,** 97 John St., N. Y.  
**Jessop, Wm. & Sons,** Sheffield, England, or 91 John, N. Y.  
**Millne, A. & Co.,** 1 Broadway, N. Y.  
**Newton & Shipman,** 83 John, N. Y.  
**Wetherell Bros.,** 93 Liberty St., N. Y.  
**Whitney, A. R. & Co.,** B'way, N. Y.  
**Wolff, R. H. & Co.,** Ltd., 118th Street and Harlem River, N. Y.

**Steel (Musher's Special).**  
**Jones, B. M. & Co.,** Boston.

**Steel Manufacturers.**  
**Etna-Standard Iron & Steel Co.,** Bridgeport, O.  
**Bethlehem Iron Co.,** S. Bethlehem, Pa.  
**Baker, Hermann & Co.,** 103 Duane St.  
**Cambria Iron Co.,** Johnstown, Pa.  
**Carbon Steel Co.,** Pittsburgh, Pa.  
**Chester Steel Castings Co.,** Phila., Pa.  
**Chrome Steel Works,** Brooklyn, N. Y.  
**Creighton Steel Co.,** Philadelphia.  
**Frankford Steel Co.,** Philadelphia.  
**Hobson, Francis, Seaman & Co.,** 97 John St., N. Y.  
**Jessop, Wm. & Sons,** Sheffield, England, or 91 John, N. Y.  
**Kayser, Ellison & Co.,** Sheffield, Eng.  
**La Belle Steel Co.,** Salisbury, Conn.  
**Landon Iron Co.,** Salisbury, Conn.  
**Lukens Iron & Steel Co.,** Coatesville, Pa.  
**Moss, F. W.,** 83 John, N. Y.  
**Pottsville Iron and Steel Co.,** Pottsville, Pa.  
**Bowland, Wm. & Harvey,** Frankford, Philadelphia.

**Skate Grinding Machinery.**  
**Singer, Nimick & Co.,** Pittsburgh.  
**Superior Steel Co.,** Pittsburgh, Pa.  
**Wordlaw, S. & C.,** Sheffield, Eng.  
**Wetherell Bros.,** 93 Liberty, N. Y.  
**Wilnot & Hobbs Mfg. Co.,** Bridgeport, Conn.

**Steel, Manufacturers' Agents.**  
**Barns, C. K. & Co.,** Philadelphia, Pa.  
**Butze, Adolph,** St. Louis, Mo.  
**Corning, Edw. & Co.,** 29 B'way, N. Y.  
**Lindsay, Jas. G. & Co.,** Phila., Pa.  
**Pierson & Co.,** 29 Broadway, N. Y.

**Steel Rails, Manufacturers of.**  
**Bethlehem Iron Co.,** S. Bethlehem, Pa.  
**Cambria Iron Co.,** Johnstown, Pa.  
**Montour Iron & Steel Co.,** Danville, Pa.  
**Riverside Iron Wks.,** Wheeling, W. Va.

**Steel, Tool.**  
**Frankford Steel Co.,** Philadelphia, Pa.  
**Jessop, Wm. & Sons,** Sheffield, England, or 91 John, N. Y.  
**Jones, B. M. & Co.,** Boston, Mass.  
**La Belle Steel Co.,** Pittsburgh, Pa.

**Step Ladders, Rolling.**  
**Bicycle Step Ladder Co.,** Chicago, Ill.  
**Coburn Trolley Track Mfg. Co.,** Holyoke, Mass.  
**Croissant, M.,** Albany, N. Y.

**Stocks and Dies.**  
**Armstrong Mfg. Co.,** Bridgeport, Conn.  
**Billings & Spencer Co.,** Hartford, Conn.  
**Butterfield & Co.,** Derby Line, Vt.  
**Hart Mfg. Co.,** Cleveland, O.  
**Oster Mfg. Co.,** Cleveland, O.  
**Saunders' Sons, D.,** Yonkers, N. Y.  
**Wells Bros. & Co.,** Greenfield, Mass.  
**Wiley & Russell Mfg. Co.,** Greenfield, Mass.

**Stone Saws and Planers.**  
**Lincoln Iron Works,** Rutland, Vt.

**Store Fixtures.**  
**Wernicke Co.,** Minneapolis, Minn.

**Stove Linings.**  
**Ostrander Fire Brick Co.,** Troy, N. Y.

**Stove Pipe Thimbles.**  
**Cheney, S. & Son, Manlius, N. Y.**

**Street Lamps.**  
**Steam Gauge & Lantern Co.,** Syracuse, N. Y.

**Structural Iron Work.**  
**Lindsay, Jas. G. & Co.,** Phila., Pa.

**Structural Tubing.**  
**National Structural Tubing Co.,** Potter Bldg, N. Y.

**Sulphuric Acid.**  
**Matthiessen & Hegeler Zinc Co.,** La Salle, Ill.

**Tacks, Brads, Staples, &c.**  
**Atlas Tack Corporation,** Boston, Mass.  
**Chess Bros.,** Pittsburgh, Pa.  
**Clendenin Bros.,** Baltimore, Md.  
**Cobb & Drew,** Plymouth, Mass.  
**Grand Crossing Tack Co.,** Grand Crossing, Ill.  
**Shelton Co.,** Birmingham, Conn.

**Tack and Nail Machinery.**  
**Kimball Bros. & Co.,** Brockton, Mass.  
**Stanley, Geo. W. Co.,** Belleville, Ill.  
**Sweetser, W. A.,** Brockton, Mass.

**Taps and Dies.**  
**Butterfield & Co.,** Derby Line, Vt.  
**Carpenter, R. I.,** Tap & Die Co., Pawtucket, R. I.  
**Manning, Maxwell & Moore,** 111 Liberty St., N. Y.  
**Wells Bros. & Co.,** Greenfield, Mass.  
**Wiley & Russell Mfg. Co.,** Greenfield, Mass.

**Testing Laboratories.**  
**Riehle Bros. Testing Mach. Co.,** Philadelphia.

**Testing Machines.**  
**Riehle Bros. Testing Mach. Co.,** Phila.

**Theatrical Hardware.**  
**Wollensak, J. F.,** Chicago, Ill.

**Thill Springs.**  
**Sabin Machine Co.,** Montpelier, Vt.

**Thrust Collars.**  
**Gouverneur Mach. Co.,** Gouverneur, N. Y.

**Time Record.**  
**Scattergood, H. W.,** Phila., Pa.

**Tin Plate Machinery.**  
**Lloyd Booth Co.,** Youngstown, Ohio.

**Tin Plates, Manufacturers of.**  
**Merchant & Co.,** Philadelphia, Pa.

**Toe Calks, Steel.**  
**Burke, P. F.,** Boston, Mass.

**Tool Chests.**  
**Am. Tool Co.,** 200 W. Houston St., N. Y.

**Tool Holders.**  
**Armstrong Bros. Tool Co.,** Chicago, Ill.

**Tools.**  
**Brown, H. & Co.,** New Haven, Conn.  
**Logan & Strobbridge Iron Co.,** New Brighton, Pa.  
**Maynew, H. H. Co.,** Shelburne Falls, Mass.  
**Millers Falls Co.,** 93 Reade, N. Y.  
**Richardson, C. F. & Son,** Athol, Mass.  
**Standard Tool Co.,** Athol, Mass.  
**Stanley Rule & Level Co.,** 29 Chambers.  
**Starrett, L. S. Co.,** Athol, Mass.  
**Stevens, J., Arms & Tool Co.,** Chicopee Falls, Mass.  
**Strelinger, C. A. & Co.,** Detroit, Mich.  
**Tuck Mfg. Co.,** Brockton, Mass.

**Tools, Blacksmith and Wheelwright.**  
**Buffalo Forge Co.,** Buffalo, N. Y.  
**Butts & Ordway,** Boston, Mass.  
**Champion Blower & Forge Co.,** Lancaster, Pa.  
**Oster Mfg. Co.,** Cleveland, Ohio.  
**Plumb, Fayette R.,** Philadelphia, Pa.  
**Wiley & Russell Mfg. Co.,** Greenfield, Mass.

**Tools, Steam and Gas Fitters'.**  
**Oster Mfg. Co.,** Cleveland, O.  
**Saunders' Sons, D.,** Yonkers, N. Y.

**Torches, Oil and Gasoline.**  
**Dangler Stove & Mfg. Co.,** Cleveland, O.  
**Schneider & Trenkamp Co.,** Cleveland, Ohio.

**Transom Lifters.**  
**Wollensak, J. F.,** Chicago, Ill.

**Tree Holders.**  
**Allentown Hdw. Works,** Allentown, Pa.

**Trucks, Manufacturers of.**  
**Clark, G. P.,** Windsor Locks, Conn.

**Tubes, Seamless Drawn Copper.**  
**Ansonia Brass & Copper Co.,** 19 and 21 Cliff, N. Y.  
**Randolph & Clowes,** Waterbury, Conn.

**Tubes, Steel.**  
**Avery Stamping Co.,** Cleveland, O.  
**Lang's, John S. Son & Co.,** 4 Fletcher St., New York.  
**U. S. Projectile Co.,** Brooklyn, N. Y.

**Tubing, Structural.**  
**National Structural Tubing Co.,** Potter Bldg, N. Y.

**Tumbling Barrels.**  
**Henderson Bros.,** Waterbury, Conn.

**Turnbuckles.**  
**Cleveland City Forge & Iron Co.,** Cleveland, O.  
**Merrill Bros.,** Brooklyn, E. D.

**Twist Drills, Makers of.**  
**Cleveland Twist Drill Co.,** Cleveland.  
**Morse Twist Drill & Machine Co.,** New Bedford, Mass.  
**New Process Twist Drill Co.,** Taunton, Mass.  
**Standard Tool Co.,** Cleveland.

**Valves, Gas, Water and Steam.**  
**Chapman Valve Mfg. Co.,** Boston.  
**Eyrn-Evans, Mfg. Co.,** Philadelphia, Pa.  
**Jenkins Bros.,** 71 John, N. Y.  
**Lunkenheimer Co.,** Cincinnati, O.  
**McNab & Harlin Mfg. Co.,** 56 John, N. Y.

**Ventilating Fans.**  
**Perkins, B. F. & Son,** Holyoke, Mass.

**Ventilator Appliances.**  
**Howard & Morse,** 45 Fulton St., N. Y.

**Vise Jaws.**  
**Newark Mch. Tool Co.,** Newark, N. J.

**Vises.**  
**Hollands Mfg. Co.,** Erie, Pa.  
**Howard Iron Works,** Buffalo, N. Y.  
**Lewis Tool Co.,** 44 Barclay St., N. Y.  
**Logan & Strobbridge Iron Co.,** New Brighton, Pa.  
**Millers Falls Co.,** 93 Reade St., N. Y.  
**Prentiss Vise Co.,** 44 Barclay, N. Y.

**Wagon Jacks.**  
**Covert's Saddlery Works,** Farmer, N. Y.

**Washers.**  
**Haskell, Wm. H. Co.,** Pawtucket, R. I.  
**Milton Mfg. Co.,** Milton, Pa.  
**Sternbergh, J. H. & Son,** Reading, Pa.

**Washing Machines.**  
**Richmond Cedar Wks.,** Richmond, Va.

**Water Meters.**  
**Worthington, Henry R.,** 86 & 88 Liberty St., N. Y.

**Water Wheels.**  
**Poole, Robt. & Son Co.,** Baltimore, Md.

**Wheelbarrows.**  
**Bryan Mfg. Co.,** Bryan, Ohio.  
**Sidney Steel Scraper Co.,** Sidney, O.  
**Withington & Cooley Mfg. Co.,** Jackson, Mich.

**Window Cord, Makers of.**  
**Samson Cordage Works,** Boston, Mass.

**Wire, Manufacturers of.**  
**Baackes & Co.,** Pittsburgh, Pa.  
**Cincinnati Barb Wire Fence Co.,** Cincinnati, O.  
**Miller & Van Winkle,** Brooklyn, N. Y.  
**Murray, Austin & Co.,** Philadelphia, Pa.  
**New Castle Wire Nail Co.,** New Castle, Pa.  
**New Haven Wire Mfg. Co.,** New Haven, Conn.  
**Prentiss, Geo. W. & Co.,** Holyoke, Mass.  
**Salem Wire Nail Co.,** Salem, O.  
**Stewart Wire Co.,** Easton, Pa.  
**Trenton Iron Co.,** Trenton, N. J.  
**Washburn & Moen Mfg. Co.,** Worcester.  
**Wetherell Bros.,** 93 Liberty St., N. Y.  
**Wolff, R. H. & Co., Ltd.,** 118th St. and Harlem River, N. Y.  
**Wright & Colton Wire Cloth Co.,** Worcester, Mass.

**Wire Cloth.**  
**Barnum, E. T.,** Detroit, Mich.  
**California Wire Works,** San Francisco, Cal.  
**Clinton Wire Cloth Co.,** Clinton, Mass.  
**Darby, Edward & Sons,** Philadelphia.  
**Ester, W. S.,** 65 Fulton, N. Y.  
**Gilbert & Bennett Mfg. Co.,** 42 Cliff.  
**Howard & Morse,** 45 Fulton, N. Y.  
**Ludlow-Saylor Wire Co.,** St. Louis, Mo.  
**N. J. Wire Cloth Co.,** Trenton, N. J.  
**New York Wire Cloth Co.,** 102 Chambers St., N. Y.  
**Scheeler & Sons,** Buffalo, N. Y.  
**Wickwire Bros.,** Cortland, N. Y.  
**Wright & Colton Wire Cloth Co.,** Worcester, Mass.  
**W. S. Tyler Wire Works Co.,** Cleve'd.

**Wire Cutters.**  
**King, J. M. & Co.,** Watertown, N. Y.

**Wire Dies.**  
**McFarland, Wm.,** Trenton, N. J.  
**Newton & Shipman,** 83 John St., N. Y.

**Wire Dowels.**  
**Bond Nail Co.,** Raynham, Mass.

**Wire Fences, See Fencing, Iron and Wire.**

**Wire Goods, Manufacturers of.**  
**Am. Wire Goods Co.,** Lowell, Mass.  
**Darby, Edward & Sons,** Phila.  
**Gilbert & Bennett Mfg. Co.,** 42 Cliff St., N. Y.  
**Ludlow-Saylor Wire Co.,** St. Louis.  
**New York Wire Cloth Co.,** 102 Chambers St., N. Y.  
**Scheeler & Sons,** Buffalo, N. Y.  
**Wickwire Bros.,** Cortland, N. Y.  
**Williamson, C. T.,** Wire Novelty Co., Newark, N. J.  
**Wire Goods Co.,** Worcester, Mass.

**Wire Hangers.**  
**Barber-Koenig Mfg. Co.,** Hazleton, Pa.

**Wire Machinery.**  
**Am. Tool Wks.,** Cleveland, O.  
**Cross & Spels Mch. Co.,** Waterbury, Conn.  
**Manville, E. J. Mch. Co.,** Waterbury, Ct.  
**Morgan Construction Co.,** Worcester, Mass.  
**Waterbury Mch. Co.,** Waterbury, Conn.

**Wire Nails.**  
**Baackes & Co.,** Pittsburgh, Pa.  
**California Wire Works,** San Francisco, Cal.  
**Indiana Wire Fence Co.,** Crawfordsville, Ind.  
**Kilmer Mfg. Co.,** Newburg, N. Y.  
**New Castle Wire Nail Co.,** New Castle, Pa.  
**Salem Wire Nail Co.,** Salem, O.  
**Taunton Wire Nail Co.,** Taunton, Mass.  
**Whitney, A. R. & Co.,** New York City.

**Wire Rods, Steel.**  
**Baackes & Co.,** Pittsburgh, Pa.  
**New Castle Wire Nail Co.,** New Castle, Pa.  
**Washburn & Moen Mfg. Co.,** Worcester, Mass.  
**Whitney, A. R. & Co.,** 17 B'way, N. Y.  
**Wolff, R. H. & Co., Ltd.,** 118th Street and Harlem River, N. Y.

**Wire Rope, Iron and Steel, Makers.**  
**Broderick & Bascom Rope Co.,** St. Louis, Mo.

**California Wire Works,** San Francisco, Cal.  
**Hazard Mfg. Co.,** Wilkesbarre, Pa.  
**A. Leschen & Sons Rope Co.,** St. Louis.  
**Trenton Iron Co.,** Trenton, N. J.  
**Washburn & Moen Mfg. Co.,** Worcester, Mass.

**Wire Rope Machinery.**  
**Kay, J. F.,** Passaic, N. J.

**Wire Straightening and Cutting Machinery.**  
**Adt, John & Son,** New Haven, Conn.

**Wood Turning.**  
**Cleveland Wood Turning Co.,** Cleveland, O.

**Wood-Working Machinery.**  
**Egan Co.,** Cincinnati, Ohio.  
**Seneca Falls Mfg. Co.,** Seneca Falls, N. Y.

**Wrenches, Manufacturers of.**  
**Bemis & Call Hardware & Tool Co.,** Springfield, Mass.

**Billings, Spencer & Co.,** Hartford, Conn.  
**Coes Wrench Co.,** Worcester, Mass.  
**Trimont Mfg. Co.,** Roxbury, Pa.  
**Walworth Mfg. Co.,** Boston, Mass.

**Wringers.**  
**Colby Wringer Co.,** Montpelier.  
**Peerless Mfg. Co.,** Cleveland, Ohio.

**Yacht Hardware.**  
**Ferdinand, L. W., & Co.** Boston, Mass.

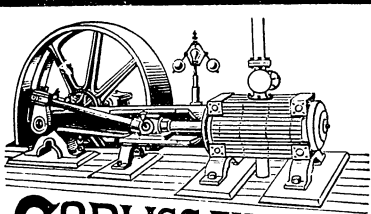
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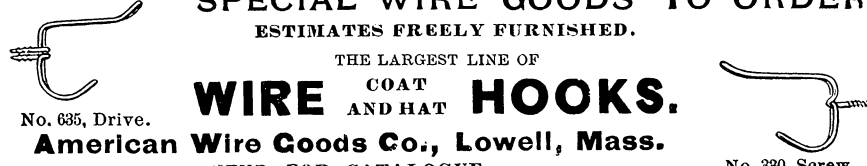
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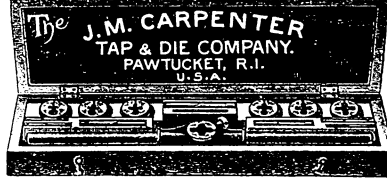
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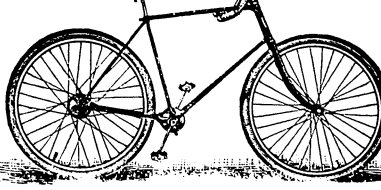
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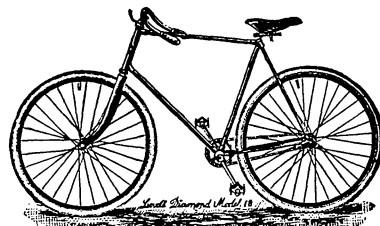
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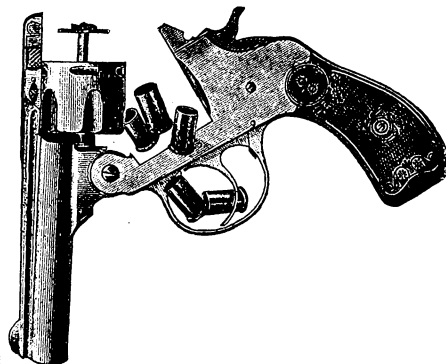
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# THE IRON AGE

THURSDAY, DECEMBER 27, 1894.

## Liquid Cinder Dumping Car.

The liquid cinder dumping car designed by John M. Hartman and built by Taws & Hartman of 1235 North Front street, Philadelphia, is arranged so that as the car is dumped the skull flows off with the cinder. To get rid of the skull it is necessary that the whole volume be thrown out quickly, because, if poured slowly, the skull settles in the car body and remains.

The car body is of steel, surmounted by cast iron plates arranged for the skull to come loose automatically as the plates cool. Cast iron plates continue down inside of the body to near the bottom, where a strip of fire brick is left to prevent any iron, passing the cinder notch, from burning a hole through the car body. The car body is mounted on a heavy cast iron truck in one piece and of ample strength.

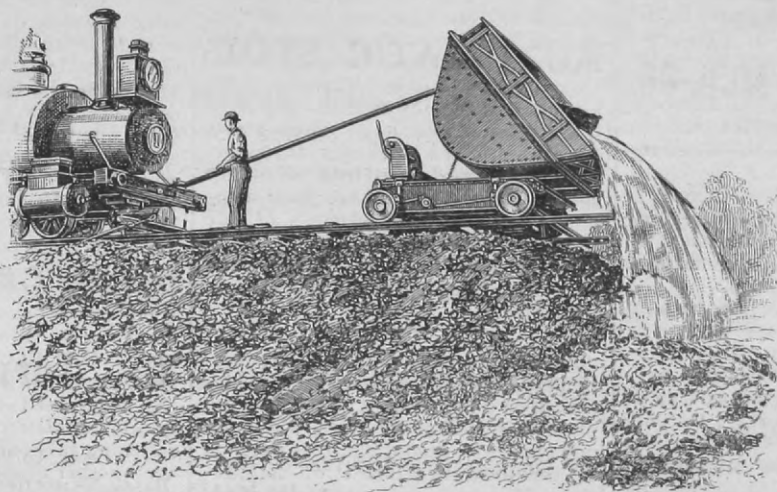
pots in constant operation, and have decided to duplicate all their machinery.

## Henry Clews and Currency Reform.

Henry Clews of New York has addressed a letter to the House Banking and Currency Committee, which contains some interesting suggestions. Mr. Clews says:

Let Congress pass an Act to authorize the issue of \$497,660,000 3 per cent. gold bonds (not coin bonds), the interest not to exceed 3 per cent.; \$346,681,000 to be issued at the discretion of the Secretary of the Treasury, with the consent of the President, to provide for absolute needs of the Treasury from time to time, in connection with and for the protection of the outstanding greenbacks which are for that amount, and to be issued only by popular sub-

Bank currency is certainly the best ever issued in this or any other country, and the system should be retained but remodeled on a more liberal basis so as to admit of more profit to the banks and thereby increase the issue. All classes of United States bonds should be taken at par as security for bank notes. The right should be given to any bank—State or National—to issue bank notes to the full amount of its capital on the deposit of United States bonds with the Controller of the Currency, and issue notes equal to the par value of said bonds. All the 4 per cent. and 5 per cent. issues of United States bonds should be taken up by the substitution of 3 per cent. gold bonds, the exchange to be made at a premium, to be paid on the 4's and 5's, equivalent to a 3 per cent. basis. This would make only one grade of United States bonds outstanding, with the exception of the currency bonds,



LIQUID CINDER DUMPING CAR.

There are four wheels upon this truck, mounted upon heavy axles journaled in cast iron babbitted boxes. These boxes are provided with coil springs to overcome any irregularities of the track, and to prevent hammering or shocking the body. Swivel trucks are dispensed with, and in the event of the car being dumped over the fall it can be easily replaced with the aid of a locomotive and chain, as the wheels are kept parallel with the truck and in revolving carry the car up the bank successfully.

The method of operating the car by means of a pole from the locomotive will be understood from the engraving, which is from a photograph of the car in operation. This view also shows how the skull floats off on the liquid mass. These cars are built to dump either forward or sideways. One of these cars has been in operation since 1891, and has handled 82,000 tons of cinder at a total cost of \$199 for relining, cleaning and repairs.

The American Tin Plate Machine & Mfg. Company, Linfield, Pa., are kept busy in the production of their special continuous roofing terne. They have at present two Buckman continuous machines and two 20 x 28 tinning

scription. The remaining \$150,979,000 of these bonds to be pledged and held in the United States Treasury against the outstanding \$150,979,000 Sherman Law Treasury notes, to be redeemed at the rate of \$2,000,000 a month from the avails of the sale of the bonds, the sale of bonds and redemption of these notes to be made simultaneously each month, commencing July 1st, 1895. These bonds could be sold in all probability at a premium, making them equivalent to  $2\frac{1}{2}$  per cent. interest bonds. The object in postponing the date to July 1 for the commencement of the liquidation of the Sherman notes is to give ample time meanwhile to formulate a more liberal National bank note system, which will admit of the issue of such notes to take the place of the notes redeemed. This will prevent a contraction of the currency. The Sherman notes being provided for, as above set forth, will leave all the bar silver stored in the United States Treasury to protect the Bland silver notes. The holders of these notes should be given the option, after January 1, 1896, to send them in for redemption in blocks of \$5,000 or \$10,000 in exchange for bar silver at the market price, not, however, to exceed in amount \$2,000,000 in any one month; all redeemed notes to be canceled. The present National

which now have but a short time before maturity, when they of course will be paid off. The United States bonds being then all of one grade, would be recognized as United States consols all over the world, and would be marketable at all the world's money centers. They would really be regarded as a full equivalent for gold, and would have the quality of an international currency bearing interest. United States bonds would have this international character, for the reason that they, being coupon bonds, are transferable like money, the interest calculated up to date of transfer, whereas the purchase and sale of English consols is mainly confined to within the boundaries of Great Britain, owing to the fact that when they are bought by an investor they are simply transferred each time they change hands on the books of record in London, without any other evidence of ownership being given. If the above suggestions are adopted for National legislation, it will not only stop the outflow of gold, but will reverse the current and speedily bring it this way.

If the above treatment were applied to the greenbacks and the "Sherman" Law Treasury notes, they would be placed permanently on a gold basis, as the United States gold bonds backing

them would bring their face value in gold in our market and the markets of Europe at any time. The same also applies to the \$337,629,504 outstanding "Bland" silver notes, as the transfer of the \$150,000,000 additional bar silver from the Sherman notes to the Bland notes would make the security behind them in silver bullion, even at the present depressed market value for the white metal, largely in excess of those obligations. This would be equivalent to putting them on a gold basis also. The gold reserve in the Treasury might easily then get down to \$25,000,000, or even less, without creating any alarm whatsoever.

### The New Homestead Scale.

Copies of the wage scale to become operative on January 1, 1895, at the Homestead Steel Works, Homestead, Pa., have been posted in various departments of the plant to allow the employees to attach their signatures to them. The new scale shows a slight average reduction in wages, the cuts in some departments being much heavier than in others. Wages of laborers have not been reduced, and announcement is made that rents for houses owned by the company and occupied by employees have been reduced, while the charge for fuel has also been lessened. These reductions, it is claimed, will offset to a considerable extent reductions made in wages under the new scale. Contrary to his usual policy, H. C. Frick, chairman of the Carnegie Steel Company, Limited, has made a statement regarding the new wage scale which is of considerable interest. The statement of Mr. Frick in full is as follows:

"At none of our works have we been so lavish of money for improvements as at our Homestead works. During the last year and a half \$4,000,000 have been spent in improving and adding to the capacity of these works. Outputs have been doubled in less than two years. As a consequence all tonnage labor had to be reduced to conform to the new conditions.

"Now, for the first six months of 1892, when the Homestead works were operated under the Amalgamated association scale of wages, the average earnings of every man and boy employed (and there are a great many boys) for every working day in the year was \$2.48. At the commencement of the year 1893 wages were adjusted for that year and the average wages for every man and boy employed was \$2.44 per day. Considering that the latter part of 1893 saw very bad business as compared with a very prosperous year (1892) it is remarkable, but true, that our men earned better wages in 1893 than in 1892.

"In January, 1894, amid the worst times the steel business has seen for many years, but I regret to say it has seen worse times since, the wages were again adjusted, with the result that the average wages of every man and boy employed during 1894 averaged \$2.24 per day (in some months of the year the average was much higher), or a reduction of about 8 per cent. It is expected that the present scale will give our men \$2.20 per day for every working day in 1895.

"A careful calculation shows that the Homestead works ran 95 out of every 100 days the past year. It should also be remembered that the average as cited embraces many common laborers, whose smaller earnings have reduced the average very much. Our skilled

workmen, of course, earn much better wages.

"Under the new scale heaters and rollers will average \$5.50 to \$7 per day. Other skilled labor proportionately. Common labor will not be reduced. This is really a readjustment to meet new conditions in method of manufacture. I might also state that we have reduced our rents and fuel proportionately.

"I take pleasure in saying that the ability of the company to maintain a higher average wage than most of its competitors has been largely on account of the success of improved machinery lately introduced by the general superintendent, C. M. Schwab, whose plans have been uniformly successful."

The new wage scale to govern wages at the Edgar Thomson Steel Works, Bessemer, Pa., will be presented to the employees during this week for their signatures. As in the case with the Homestead scale, the claim is made that the reductions in wages are more in the nature of readjustments, which have been made necessary owing to improved methods of manufacture by which the tonnage is very largely increased.

It is not expected that any serious trouble will result over the introduction of new and lower wage scales at the Homestead and Edgar Thomson plants, although there will be the usual dissatisfaction expressed by the men who have suffered the largest cuts. Both plants are closed for the usual annual repairs, but are expected to resume operations again as soon as these have been completed. Certain departments of the Homestead plant will be idle longer than others by reason of the extensive changes and improvements that are contemplated.

The Railroad Coal Operators' Association met in Pittsburgh last week to decide upon a new mining rate to take the place of the old 69-cent rate, which expired recently, according to the decision of the Interstate Board of Arbitration. The new rate was to be either 62 cents, 60 cents or 55 cents, and the latter rate was finally agreed upon. The resolution providing the new rate declares that 55 cents shall be the rate for thin vein coal going West; for coal going East, the rate shall the same as paid by the Penn and Westmoreland gas coal companies. The resolution pledges the operators to advance the mining rate when it can be maintained in competing mines. It states that the coal trade was never in such a serious condition as now, and that the only relief is through an equitable basis for different branches, to prevent cutting below legitimate profits. The operators will demand a rearrangement of freight rates, which is one of the leading features of demoralization. To allow Pittsburgh the benefit of her natural advantages the railroads must establish a rate on the mileage basis, measured by the coal producing districts. Giving the thick vein coal the same rates West, without allowing the thin vein coal to go East on the same terms, works to the disadvantage of the Pittsburgh operators, as the thick vein operators have a lower freight rate East and a lower mining rate.

A test of the strength of a 3-inch concrete floor, reinforced by a sheet of expanded metal embedded in it and hooked over the beams, was made December 15 by the Expanded Metal Fireproof Construction Company of New

York, in the New Salvation Army Building on East Fourteenth street, New York. The floor is flat, but reinforced at intervals of about 5 feet by channel iron arches (laid with the flat side underneath) resting upon the lower flanges of the floor beams. The channel is filled with concrete and the haunches of its arch filled in with concrete to the floor level. On a section of floor midway between the arches and beams, 12 inches square, a load of 3800 pounds of pig iron was piled without causing deflection or fracture, the test being discontinued on account of the falling over of the pile of pig iron. The expanded metal, as illustrated in our issue of December 7, 1889, consists of a sheet of soft steel, slashed and opened out, forming a sort of net, with thin, deep meshes on edge.

**The Best Material for Boiler Tubes.**—A Committee of the American Railway Master Mechanics' Association, of which T. A. Lawes, of Indianapolis, is chairman, has sent out the following list of questions relating to boiler tubes: 1. What is the best material for locomotive tubes? 2. Please give your reasons for this preference. 3. In ordering tubes, do you furnish specifications? If so, please send a copy of same. 4. In your opinion, would a tube made of a fair quality of material, combined with a safe end made of a good quality of material, answer for all practical purposes? 5. What is the maximum length of locomotive tubes of different diameters? 6. What should be the thickness of metal for tubes of different diameters? 7. How often may tubes be pieced out with advantage and safety? 8. When and for what causes should tubes be condemned? 9. How do you test tubes and safe ends? 10. In making specifications for tubes, is the effect on them of the water used taken into consideration? 11. Describe your methods of fastening tubes at front and back end; say whether copper ferrules, and what kind of tools are used for calking and turning over the ends of tubes.

The General Electric Company are now building at their Schenectady works one of the largest alternating current generators ever constructed. The generator is to be installed at St. Louis, Mo., in the station of the Edison Electric Illuminating Company, and will supply current for incandescent and arc lighting and for motor service. The generator is of 800-kilowatts capacity, has 80 poles, and is to be driven by a Hamilton-Corliss engine at 90 revolutions per minute. On account of the great size of the frame difficulties were to be expected in producing the castings, but thanks to the facilities of the Schenectady works, no trouble was experienced in pouring even the large frame casting shown. This single piece, made up in part of wrought iron embedded in the castings, weighs 35 tons and measures 24 feet over all. The armature is iron clad and is 16 feet in diameter, weighing nearly 100,000 pounds. The armature will be supported on a 22-inch shaft. The completed generator will supply, when at full load, 667 amperes at 1,200 volts, equivalent to 16,000 16-c. p. lamps. In connection with this it should be stated that the great size of the generator was necessitated by the requirements under which the machine is to be operated, chief of which is the low speed of revolution.

Open Hearth Steel.—V.\*

The Basic Process.

The introduction of this process was from the first attended by unusual success, and it continues to make rapid strides in all those parts of the world where the available materials have impurities that prevent the adoption of acid hearths for the manufacture of steel. The rate of increase of basic open hearth steel in Europe during the last eight years will, we believe, be repeated in this country during the coming eight. Unlike the Bessemer basic process, it allows the use of an iron having only a moderate quantity of phosphorus, for the bath does not depend on phosphorus as a heat producing agent, as in the after blow in a converter, and the quality of steel obtained is superior to all other processes. The advantages over the Bessemer process are: That the basic material forming the lining can be put in and maintained easier in a furnace than in a converter; the temperature of the bath does not depend, as the Bessemer process does, on the presence of sufficient proportions of silicon, carbon and phosphorus; the metal is more easily regulated, and the slag may be treated and removed with less trouble and waste and without danger of its yielding back to the bath any of its contents of phosphorus.

There are, of course, many opinions as to the best form of furnace, and we endeavored in preceding articles to show the advantages offered by several of the types illustrated, more particularly for the basic hearth. The special difficulties encountered may be enumerated as follows: A larger expansion in the body of the furnace, to be provided for by strong springs under the heads of the rods tying the buckstaves together. Basic materials do not successfully carry any weight, and taken in conjunction with the expansion the maintenance of the silica roof gives much trouble. Finally, the lime dust carried over by the gases into the regenerators choke up and flux the checkers very rapidly. To meet these difficulties it is advisable to assist the support of the roof, or at least to provide that its thrust be not entirely encountered by the side walls; and, in view of the life of the regenerators being short, there should be extra facilities for changing the checkers rapidly by separating the chambers from the furnace altogether or by some other convenient method. To meet the movements of the structure due to expansion and to gradual sinking of the roof (in cases where this has no additional support) due to the wasting away of the hearth and lower walls, the binding plates should be unusually strong and the furnace well tied together in both directions. It is now usual to find the plates and the buckstaves of mild steel. The weight of the roof may be in part taken off the basic hearth by springing a long flat arch over the charging doors from block to block of the furnace. The cast iron girders or plates under the basic bottom should be so arranged that a broad flange will support the weight of the silica blocks independently of the hearth at the point where the layer of neutral material intervenes.

The basic mineral or composition used to make the hearth forms a very large item in the cost, the amount used varying from 50 to 300 pounds per ton of ingots produced, and the manufact-

urer is fortunate who can obtain a suitable magnesite or dolomite within easy reach of his works. Magnesite (carbonate of magnesia) contains up to as much as 95 per cent. of magnesia, and has long been recognized as extremely refractory, its special advantage in the melting furnace being that it does not fuse even in direct contact with the acid or silica part of the lining. The finest varieties occur in the Island of Euboea, in the Aegean Sea, and in some parts of Styria. The mineral is calcined at a high temperature to drive off the carbonic acid and to reduce it to a friable state, in which it may be easily ground and the small cakes of silica and other matters which are found disseminated through the magnesia may be separated. When calcined at a lower temperature and afterward subjected to a great heat there is a very large and objectionable contraction, and the higher calcination heat is therefore absolutely necessary. In the very powdery state to which it is thus reduced it cannot be formed into bricks having any cohesion, and it is usual to add sufficient boracic acid, clay, or caustic magnesia, to cause the particles to flux slightly. The bricks are molded under strong pressure, after the addition of sufficient water to make them adhere before burning.

Dolomite, or magnesian limestone, is of more frequent occurrence. It contains from 30 to 60 per cent. of lime, 30 to 40 per cent. of magnesia and not more than 3 per cent. of alumina and oxide of iron or 2 per cent. of silica. It may be used either in the form of bricks or as a mortar, the binding agent in either case being anhydrous tar in as small a quantity as possible. When calcined at a high temperature it is called shrunk dolomite, and it differs from magnesia in that it is subject to decomposition in air and absorbs water. It should be calcined, therefore, only as required. Although not by many degrees so durable as magnesite under a high heat, its price is so low that its use is now more extended than that of the latter. From 200 to 300 pounds are required per ton of ingots, inclusive of the additions necessary for repairs between heats. In contact with the silica lining it immediately fluxes.

The last objection entails the use of a neutral material to form a dividing line between the hearth and the silica walls above the slag line of the furnace. The most satisfactory of these is chromite or chrome ore, which should contain at least 40 per cent. of chromic acid and not more than 6 per cent. of silica. It is derived chiefly from Scan-

prepared for a charge in the following way: A basin is built of fire brick on the bottom plates of the hearth so as to receive a lining of basic material of from 12 to 15 inches thick; this backing of fire brick saves a little of the labor and material. In laying the hearth two courses may be adopted. If of magnesia, it may be burnt in layer by layer, or it may be compactly built of 11 x 4½ x 3 inch bricks, covered with some two inches of loose magnesia, with a very slight flux addition. If of dolomite, it may be mixed with tar and rammed, layer by layer, with red hot irons, or it may be built in brick work as described. In the matter of speed bricks are much preferable, but it is doubtful whether the bottom is so sound and so free from risk of lifting as when it is rammed or burnt into one solid piece. Both practices are commonly found. The silica blocks are built as usual, and as much as possible supported independently of the hearth. In the basic process the ports should be as simple a block as possible. The basic lining is carried to the bottom of the charging doors and leveled all round to receive a layer, about 2 inches thick, of chrome ore, mixed and rammed with tar. If the weight of the silica wall and roof above this point is carried independently, a thin layer of carbon will be sufficient to isolate the dolomite and silica; but it should be understood that carbon blocks will not carry any weight and will at once flux under such conditions. The tap hole is formed by a wooden plug, which is burned out when the furnace is fired.

Pig iron for the basic hearth may have the following limits of composition:

	Per cent.
Graphitic carbon.....	0.20 to 0.35
Combined carbon.....	2.30 to 2.50
Silicon.....	0.30 to 0.80
Phosphorus.....	1.00 to 3.00
Sulphur.....	0.03 to 0.06
Manganese.....	2.30 to 2.80

That is to say, its carbon should be chiefly combined carbon, to facilitate melting; its silicon, unless the furnace makes a habit of working cold, must be as low as possible, to prevent destruction of the lining; the manganese must be high or the sulphur will seriously increase, and the lime additions will be so unwieldy that the slag will be excessively troublesome and costly in fuel. To reduce the graphitic carbon the pig iron may be cast in iron chills or in a cinder bed, a method that insures another advantage—namely, that there is no increase of silicon in the bath through molding sand adhering to the pigs. The following pig irons from various parts of the world have been successfully treated on a basic hearth:

	1. Per cent. 80	2. Per cent. 26	3. Per cent. 75	4. Per cent. 50	5. Per cent. 35	6. Per cent. 34
Proportion of pig iron in charge.....	3.20	0.40	2.50	.....	.....	0.80
Combined carbon.....	3.20	0.40	2.50	.....	.....	0.80
Graphite.....	.....	3.25	.....	2.8	3.50	3.20
Phosphorus.....	3.00	0.60	2.63	0.61	1.20	0.105
Sulphur.....	0.04	0.013	0.042	0.05	0.09	0.016
Silicon.....	0.40	1.24	0.37	1.10	0.95	2.10
Manganese.....	1.75	1.19	1.63	.....	1.33	2.19
And the resultant steels gave:						
Carbon.....	0.12	0.14	0.15	0.16	0.10	0.336
Phosphorus.....	0.03	0.050	0.060	0.06	0.03	0.160
Sulphur.....	0.018	0.074	0.043	traces	trace	0.006
Silicon.....	nil	0.004	trace	nil	trace	0.035
Manganese.....	0.40	0.598	0.60	0.35	0.28	0.304

dinavia and Russia, and costs \$20 to \$25 per ton, free on board. Bauxite, with over 50 per cent. of alumina, is another neutral mineral, and it now appears to be mined in Arkansas and Georgia. Gas retort carbon is successfully used in some works in England.

With these materials the furnace is

On the Continent of Europe the large quantity of available scrap gave steel manufacturers the lead in basic work, for it was only after many mishaps and dear experiences that the pig and scrap process was perfected. But in this country and in England the difficulties of maintaining a basic lining through

\* See *The Iron Age*, November 15, page 851; November 29, page 940; December 13, page 1054, and December 20, page 1111.



the long period requisite for the pig iron charge were gradually overcome. In Europe the scrap process still prevails, under conditions that do not and will not occur here. Omitting the spiegel and ore additions the following shows the practice in Germany:

	Pig iron. Per cent.	Scrap. Per cent.
Union .....	15	80
Witten .....	15	82.7
Seraing (Belgium) .....	6.6	93.3
Dillingen .....	20	80
Dortmund .....	10 to 20	80 to 90
Bochum .....	23.53	71.73
Phoenix .....	15	75
Oberhausen .....	15	85

The pig iron is usually white and contains about 2 per cent. of phosphorus. Such proportions of pig and scrap work in the furnace two or three times as quickly as if the proportions were reversed. One of the best examples of the scrap charge that we can present is the following, being the results obtained at Alexandrowski, near St. Petersburg. The furnace worked 58½ days, and inclusive of all Sunday and repair stoppages the yields were:

	Tons.	Pounds per ton.
Pig iron (Si 1% P 0.6%) .....	274	626.67
Cast iron scrap .....	41½	94.91
Old rails (P 0.7%) .....	479	1,095.53
Steel scrap .....	125	285.89
Hematite pig iron .....	10	22.87
Spiegel (10% Mn) .....	150	247.45
Ferromanganese (60% Mn) .....	½	1.14
Total charge .....	1,050	2,401.46
Ingots produced .....	979: 8	2,240.00
Loss .....	70: 12	161.46

	Tons.	Pounds per ton.
Coal for gas producers .....	427	976.59
Additions, &c. .....		172.7
Lime .....		30.8
Magnesite bricks .....		81.4
Magnesite mortar .....		1.3
Graphite .....		2.4
Coal tar .....		8.8
Chrome ore .....		70.0
Manganese ore (25 per cent. Mn) .....		

The finished steel had the following analysis:

	Per cent.
Carbon .....	0.16 to 0.20
Manganese .....	0.25 to 0.35
Phosphorus .....	0.04 to 0.08
Silicon .....	nil.
Sulphur .....	traces.

At the works of the Gratz Southern Railway, Austria, the following proportions of materials are used to produce a ton of rail steel ingots:

	Cwt.
White pig iron .....	5.2
Scrap iron .....	14.8
Spiegel (12 per cent. Mn) .....	0.8
Ferromanganese and ferro silicon .....	0.2
Total .....	21.0
Coal for producers .....	6.0
Production of steel per man per shift .....	24.8

The white iron costs \$14. Each charge takes a little over five hours to complete, and the furnace roof stands 150 charges, the other parts of the furnace being good for 350 to 400 charges.

As we have said, the districts are limited where scrap is so plentiful as to form the bulk of a charge. We shall now give some examples of pig and scrap charges such as are made in England. In that country 20 to 25 per cent. of scrap is the usual practice. The pig iron is charged cold on a thin layer of lime, and the slag, which should never have more than 20 per cent. of silica, is kept basic from the first. The idea of charging with molten pig iron has been found impracticable, as the metal attacks the dolomite hearth very fiercely; molten metal is, however, used at Witkowitz. The scrap is charged little by little after the fusion of the bath. Any ore may be used for reduction purposes provided it be fairly rich in iron and low in silica; its content of phosphorus is immaterial.

The slag forms about 20 to 30 per cent. of the weight of the bath, and two difficulties have to be steered between—namely, running off an excess of slag during the working of the charge means a loss in oxide of iron, and the retention of an excessive slag to protect the bath means an additional cost in fuel. In the event of the bath being decarburized and the boil finished before the phosphorus is properly eliminated, a few hematite or other pigs must be thrown in to stimulate the metal. The elimination of the manganese in the pig iron does not commence until very late, and it is therefore of little service in removing a high sulphur; should the sulphur be high, therefore, it is advisable that some manganiferous mineral be added and part of the slag tapped off at once before the temperature of the bath increases. The addition of ferromanganese in the bath instead of the ladle is too costly to be generally applied, but it should be noted that it frees much of the iron in the slag, as the following analysis will show:

	Before final addition.	During Casting.
Carbon .....	0.10	0.13
Silicon .....	0.004	0.013
Manganese .....	0.100	0.325

	Slag.
Fe O .....	17.45
Fe <sub>2</sub> O <sub>3</sub> .....	5.09
Fe .....	17.20
Mn .....	3.31
Si O <sub>2</sub> .....	15.6

First Example.—The following analyses describe the materials:

	Cleveland pig iron.	Cast Scrap.	Iron rails.	Wrought Scrap.	Works Scrap.	Hematite pig iron.
Carbon .....	3.5	3.5	...	...	0.30 to 0.45	3.0 to 4.0
Silicon .....	0.70 to 2.2	0.30 to 1.0	...	...	under 0.02	0.7 to 1.2
Phosphorus .....	1.20 to 2.0	0.40 to 1.20	0.25 to 0.65	0.20 to 0.50	0.03 to 0.10	0.03 to 0.05
Sulphur .....	0.06 to 0.15	under 0.05	0.04 to 0.20	...	0.01 to 0.05	0.06 to 0.18

	Spiegel.	Ferromanganese.
Carbon .....	3.5 to 5.0	5.5 to 6.75
Phosphorus .....	0.03 to 0.05	0.08 to 0.15
Manganese .....	10 to 20	50 to 80

The bath was reduced by the use of artificial briquettes consisting of five parts by volume of lime and four parts of roll cinder. The results of six furnaces over a period of five months (854 charges in 428 days) were:

	Tons.	Cwt.	Pounds used
Charges.			
Cleveland pig iron .....	1,758	18	725.66
Cast scrap .....	598	4	246.79
Old rails .....	1,258	0	519.01
Miscellaneous scrap .....	1,353	10	764.69
Hematite pig iron .....	270	11	111.62
Spiegel .....	515	3	212.54
Ferromanganese .....	32	5	13.30
Total .....	6,286	11	2,593.61

	Tons.	Cwt.	Pounds used
Produce.			
Hard and soft ingots .....	5,429	9	2,240.00
Loss .....	857	2	353.61

	Tons.	Cwt.	Pounds used
Materials.			
Coal consumed .....	4,913	8	2,027.09
Limestone .....	404	9	167.86
Lime cinder briquettes .....	107	3	42.20

	Per Cent.
Yields.	
Yields in ingots .....	86.4
Yield in scrap .....	2.6
Waste .....	11.0

In the resultant steel the highest phosphorus is 0.07 per cent. and of sulphur and silicon there are only traces. The average time of the charge is 9½ hours, and for repairs 2 hours 20 minutes. The dolomite and tar hearth stands 150 to 200 casts.

Second Example.—The charge was 20 tons, and consisted of 25 per cent. of steel scrap and 75 per cent. of pig iron having 2.5 per cent. carbon, 0.357 per cent. silicon, 0.042 per cent. sulphur, 2.63 per cent. phosphorus, and 1.68 per

cent. manganese. The reducing agent used was English pottery mine, 280 pounds per ton of ingots produced, and of limestone 330 pounds per ton were required. The charge was in the furnace 9½ hours and produced a steel of the following composition:

Carbon .....	0.150
Silicon .....	trace
Sulphur .....	0.043
Phosphorus .....	0.080
Manganese .....	0.600

Average of four mechanical tests:

Breaking strain, tons per square inch .....	28.87
Extension, per cent., 8 inches .....	24.50

Third Example.—The Cleveland iron of England is too high in silicon and sulphur to be used successfully, but if smelted with some manganiferous ore it is produced with the following results:

	Tons.	Cwt.
Cleveland forge pig .....	41	5
Scrap steel .....	9	5
Basic pig iron .....	1	8
Cleveland ore .....	2	3
Spanish hematite .....	2	0
Lime .....	8	19
Ingots produced .....	49	4
Average time in furnace .....	9.14 hours.	
Average time between heats .....	5.9 hours.	

The average analysis of the steel produced:

Carbon .....	0.17
Phosphorus .....	0.06
Manganese .....	0.53
Sulphur .....	0.09

Fourth Example.—In this case the manufacturers have had great difficulty in smelting a pig iron suitable for the basic process, the object being to use up a quantity of phosphoric steel scrap.

	Cleveland pig iron.	Cast Scrap.	Iron rails.	Wrought Scrap.	Works Scrap.	Hematite pig iron.
Carbon .....	3.5	3.5	...	...	0.30 to 0.45	3.0 to 4.0
Silicon .....	0.70 to 2.2	0.30 to 1.0	...	...	under 0.02	0.7 to 1.2
Phosphorus .....	1.20 to 2.0	0.40 to 1.20	0.25 to 0.65	0.20 to 0.50	0.03 to 0.10	0.03 to 0.05
Sulphur .....	0.06 to 0.15	under 0.05	0.04 to 0.20	...	0.01 to 0.05	0.06 to 0.18

	Spiegel.	Ferromanganese.
Carbon .....	3.5 to 5.0	5.5 to 6.75
Phosphorus .....	0.03 to 0.05	0.08 to 0.15
Manganese .....	10 to 20	50 to 80

The following figures give the average result of 40 casts from a 12 ton furnace:

	Pig iron.	Steel produced.
Carbon .....	3.12	0.11
Silicon .....	0.52	0.06
Sulphur .....	0.34	0.08
Phosphorus .....	1.55	0.05
Manganese .....	0.37	0.53

The dolomite used in the hearth, and the slag sample taken at tapping time showed:

	Dolomite.	Slag.
Silica .....	17.24	4.80
Alumina and oxide of iron .....	38.08	6.97
Lime .....	32.84	56.01
Magnesia .....	7.84	31.07
Sulphur .....	0.33	...
Phosphorus .....	1.78	...

The charges were:

	Tons.	Cwt.
Pig iron .....	245	5
Scrap .....	183	
Ferromanganese .....	2	11½
Roll scale .....	21	
Lime .....	39	10

Roll scale was used because it was advisable to keep down the silicon as much as possible; being high in oxygen it decarburizes the bath rapidly, but it is advisable to compress it into bricks because in particles it is to a certain extent carried over by the draft into the regenerators. The same objection applied to using dust lime, and it is much preferable that it be added in the form of clean broken stone.

Fifth Example.—The charge consisted of:

Pig iron .....	202,496
Scrap (P = 0.85 per cent.) .....	291,776
Ferromanganese .....	10,594
Hematite pig .....	21,672

Total .....	526,542
Ingots produced .....	491,316 = 93%

The materials had the following analyses :

	Pig iron.	Hematite pig.	Steel produced.
Carbon.....	3.40	4.2	0.14
Silicon.....	1.24	2.28	0.004
Sulphur.....	0.013	0.004	0.074
Phosphorus....	0.601	0.058	0.050
Manganese.....	1.19	0.20	0.598

Over a period of about a year the dolomite used for lining and repairs

#### Foundation of a High Building.

Through the courtesy of the *Railroad Gazette* we are enabled to present engravings of the foundation of one of the latest high buildings. From our contemporary we take the following:

Among the tall buildings now being constructed in New York City is the

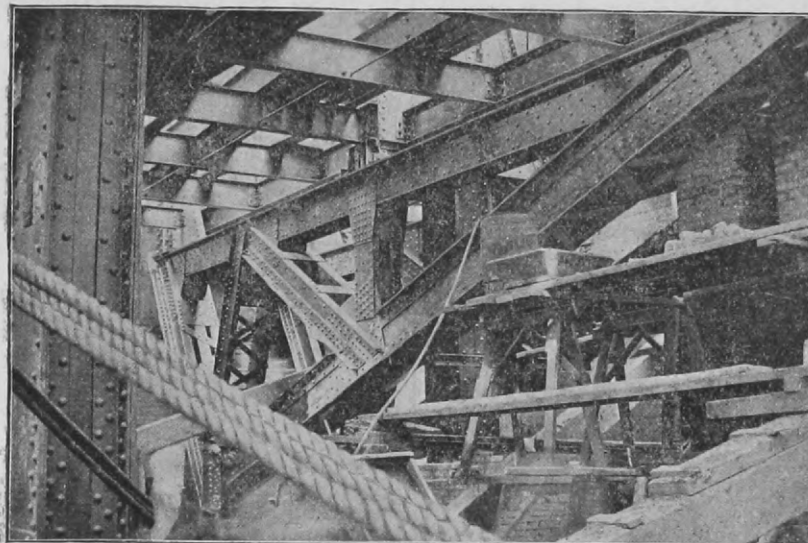
*World Building*, 309 feet; for the *American Surety Building* (now in process of erection at Broadway and Pine streets), 302 feet; for the *Home Life Insurance Building*, 277 feet. Hight from curb to main roof beams: For the *American Surety Building*, 300 feet; for the *Manhattan Life Insurance Building*, 242 feet; for the *Home Life Insurance Building*, 205 feet; for the *World Building*, 194 feet. From these dimensions it is deduced that the hight of the main roof beams bears the following ratio to the total hight: For the *World Building*, 62 per cent.; for the *Manhattan Life Building*, 69 per cent.; for the *Home Life Insurance Building*, 74 per cent.; *American Tract Society*, 78 per cent.; the *American Surety Building*, 99 per cent.

The highest of these five buildings, viz.: the *Manhattan Life Insurance Building*, is 63 feet higher than the top of Trinity Church spire, and the average hight of all five is 22 feet above Trinity Church spire.

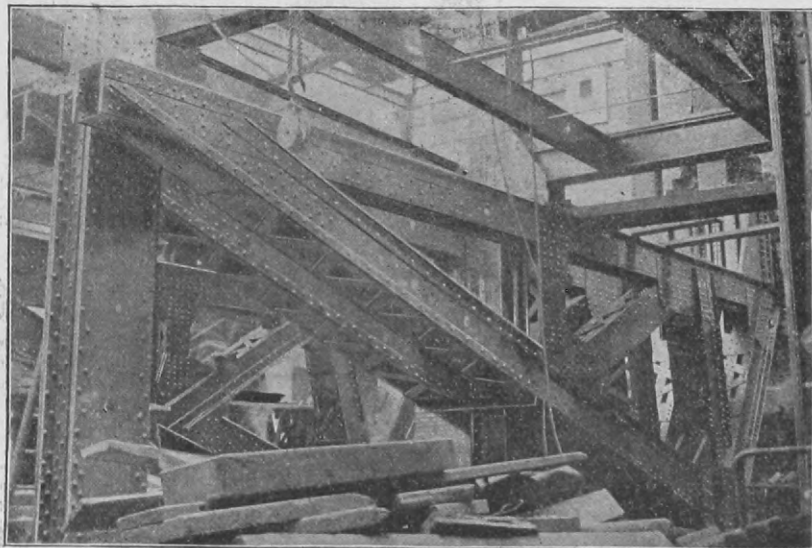
In arranging for the foundations of this building seven borings were made (distributed over the whole lot), to an average depth of 76 feet below the curb, the deepest being 105.5 feet. These borings showed a layer of clay averaging 8 feet thick, at an average distance of 38 feet below the curb, the level of mean high tide being 35 feet below the curb. Under this layer of clay was found fine sand, and beneath that still, very fine sand. At no point was rock touched; and from this it was concluded that foundations requiring caissons to be sunk to solid rock, such as have been used under the *Manhattan Life Building* and the *American Surety Building*, would not be enough better than pile foundations to make up for the very considerable difference in cost. The caissons under the *Manhattan Life Building* rest upon rock 54 feet below the Broadway curb, and those under the *American Surety Building* 71 feet below the curb; whereas, in the case of the *American Tract Society Building* similar foundations would have had to extend down at least 100 feet below the curb, and probably more, to rest upon rock. A compromise might, perhaps, have been made by resting the caisson foundations in the sand at no great depth; but pile foundations were decided upon, and piles 10 to 14 inches in diameter at the head, varying from 15 to 40 feet in length, were driven as close as possible. Under some of the heaviest reactions it was necessary to drive these piles 18 to 20 inches center to center, and some difficulty was experienced in driving the last few of each clump. They were driven with a 2000 pound hammer, falling 10 feet to 22 feet, and in most cases they sunk less than 1 inch under the last blow. All piles were cut off at the level of mean high tide, viz.: 35 feet below the curb.

The heads of the piles were embedded in 16 inches of concrete, immediately over which was placed a 10-inch course of granite blocks. On this a brick pier was built in "stepped up" courses and capped with a 12-inch granite course, on the top of which was placed a granite block 18 inches thick, to receive the cast iron base of a column or cantilever. This brought the bottoms of the cast iron bases to the level of 27 feet 9 inches below the curbstone.

The columns in this building are spaced about 19 feet apart in one direction and 17 feet 9 inches in the other. Columns which are located at or near the property line cannot be provided



First Cantilever on Nassau Street Side.



Second Cantilever on Spruce Street Side.

#### FOUNDATION OF A HIGH BUILDING.

amounted to a little over 1000 pounds per ton of ingots produced.

A. W. Chesterton & Co., 49 India street, Boston, Mass., are placing on the market a new piston packing called the "Metallo." This packing, the manufacturers state, has a gum core, compounded with antimony and other ingredients, which enables it to stand great heat without losing its elasticity. It is covered with a series of braids of Archangel flax, with which is incorporated a metallic wire, which holds the packing together, and is especially adapted for high pressures and for rolling mill engines, as it stands great wear.

*American Tract Society's Building*, on the corner of Spruce and Nassau streets, which occupies a lot having about 100 feet front on Nassau street, and 94 feet front on Spruce street. The location is in the vicinity of the great newspaper buildings, and a view of the building when finished will be had from Broadway, across the open space of the City Hall Park. This building will be 23 stories high; the hight of the main roof beams above the street curbstone being 240 feet, and the final 66 feet higher, making 306 feet from curb to final. The corresponding dimensions for some of the other tall buildings in New York are as follows: Hight from curb to final: For the *Manhattan Life Insurance Building*, 350 feet; for the

with proper foundations whose centers shall be under the center of pressure without encroaching on the adjoining lot. For this reason the important wall columns of many tall buildings nowadays are supported on the ends of cantilever girders or trusses. Such cantilevers are usually made of box or plate girders having solid webs. The length of the overhanging portion depends upon the kind of foundation used, and is greater the more the base of the foundation is spread out. The length of the overhanging portion and the available depth are important factors in determining whether to be economical the cantilevers should have a solid or an open web.

In the American Tract Society Building three outside columns on the east side and three outside columns on the south side are supported on the ends of steel cantilever trusses of triangular shape (as shown in the two views here presented), each about 12 feet deep and 40 feet long, extending back into the interior of the building, to include two anchorage columns. The sizes and dimensions of these six cantilevers vary somewhat with the loads to be carried, but they are substantially alike in construction.

Each cantilever is composed of two trusses, one passing either side of the anchorage columns and being connected to these columns by inverted brackets. The pairs of trusses vary in weight from the lightest, which is 18 tons, to the heaviest, which is 31 tons, making each truss of the heaviest cantilever about 15½ tons in weight, exclusive of the brackets and the short cross girders which support the columns. This cantilever was figured to carry 748 tons on the free end at a distance of 7 feet from the center of its base. Each of these trusses was shipped in four pieces. Two of these six cantilevers support a column midway between the anchorage columns and the end, besides the end column. All the supported columns rest on short box or plate girders, which extend across the tops of the pairs of trusses, and vary in size according to distance between the members of a pair and the load to be carried. All connections are riveted, and the sections of each member are double or box sections.

All columns and cantilevers in the cellar rest on cast iron bases, the largest single casting weighing 3½ tons. The bases for the cantilevers are in pairs, one base for each truss. The heaviest of these pairs weighs 6 tons.

The columns are constructed of steel angles and plates, forming box sections. The largest cellar column has three 28-inch plates on each of two sides, and the distance between backs of angles in the other direction is 16½ inches. This column has a section of 153 square inches, distributed as follows:

	Inches.		Inches.
4 plates	28 x 1½	2 webs	16 x ¾
2 plates	28 x 7-16	2 webs	4 x ¾
4 angles	6 x 6 x ¾	2 webs	14 x 7-16

and weighs 520 pounds to the foot.

The architect for this building is R. H. Robertson of 160 Fifth avenue, New York, and the contractor for the iron work Carnegie Steel Company, Limited, for whom the Atlas Iron Construction Company of New York are doing the erecting.

On Monday, December 24, the rates on coke in carloads from points on the Southwest Pennsylvania Railroad to Collinwood, Ohio, via Cleveland, Ohio, and Lake Shore and Michigan Southern Railway, were withdrawn.

## Western Foundrymen's Association.

The regular monthly meeting of the Western Foundrymen's Association was held Wednesday evening, December 19, 1894, at the Great Northern Hotel, Chicago, with President Geo. M. Sargent in the chair.

The minutes of the last meeting were approved.

Among those present were the following:

George M. Sargent, the Sargent Company, Chicago; D. L. Cobb, Sloss Iron & Steel Company, Chicago; C. A. Sercomb, Schwab & Sercomb, Milwaukee; W. T. Warner, Illinois Central Shops, Chicago; Jas. Fyfe, Pickands, Brown & Co, Chicago; E. H. Walker, Emerson, Talcott & Co., Rockford, Ill.; A. M. Thompson, Liak Belt Machinery Company, Chicago; Jno. M. Sweeney, Chicago; Wm. N. Moore, Joliet Stove Works, Joliet, Ill.; J. Vrooman, Bloomington Stove Works, Bloomington, Ill.; C. E. Louis, Forster, Hawes & Co., Chicago; Jno. T. Rowlands, Wm. Gept, J. I. Case Threshing Machine Company, Racine, Wis.; Wm. Wilson, S. Obermayer Company, Chicago; S. T. Johnston, Whiting Foundry Equipment Company, Chicago; W. W. Messenger, Western Electric Company, Chicago; H. S. Vrooman, N. C. Fisher, Garden City Sand Company, Chicago; L. D. Rosenheimer, C. A. Hankle, Milwaukee Malleable Iron Company, Milwaukee, Wis.; John Bailey, Illinois Iron & Bolt Company, Carpentersville, Ill.; R. F. Palmer, Chicago; B. M. Gardner, Chicago.

The secretary read the following letter from O. J. Stantial, chairman of the Test Bar Committee:

"GRAND RAPIDS, MICH.,  
"December 18, 1894."

"We have concluded not to make a final report this month, but to continue our tests for two or three months more, and would like to have the president appoint four or six additional members to the present committee, with the understanding that they shall be active members and willing to do their share of the work. Mr. West has offered to furnish us with an additional apparatus for casting test bars, so that it will not take so long a time to obtain results. I have only to say, at present, that with Mr. West's last style of gating and casting bars we have met with entire success in obtaining test bars free from flaws. You will remember that at our last meeting Mr. Sweeney was of the opinion that if we enlarged the runner in Mr. West's original method we should obtain better results. It may be of interest to the members to know that I have followed out a series of tests, casting 12 bars with the old method, using the small runner, and 12 bars using a runner 1 inch in diameter, and find that there is no difference in the test bars, which with both runners showed a very large percentage of flaws. On breaking the 1-inch runners I found them to be perfectly solid at point of fracture, which would seem to bear out an opinion expressed at the last meeting by one of the members, who made the assertion that he believed the runners poured from the top would show better than the bars run from the bottom. Our present work is entirely upon Mr. West's last method, in which he uses the swirl gate, which method at the present time looks very promising to us."

On motion, duly seconded, the report was accepted and ordered placed on file. The secretary also reported that he had received a letter from Thos. D. West saying that he was anxious that the committee should continue their work on this line, and asking that additional members be appointed at this meeting to carry forward the good results obtained.

C. A. Sercomb: I move that additional members be appointed to the committee. On being duly seconded the motion was carried.

W. N. Moore: We are all foundrymen and all melting iron. All that have access to testing machines should take up this work. I chanced a short time ago to visit a neighboring foundry and accidentally saw lying there some broken iron test bars, and asked about them. I found also that they had been cast on end and that there had been a number of tests made, and, thinking that the matter would be of interest in connection with this work, I ascertained some facts.

The series of tests was made at the Joliet Works of the Illinois Steel Company by John Pettigrew, who has charge of the foundry at these works. The bars are round, and in tensile tests are 1 inch in diameter, and the figures are reduced to strength in pounds per square inch of area. There are two kinds of iron represented. The four bars poured from a single ladle are in the first table, and they broke at 19,569, 19,811, 25,388 and 19,225. It will be noted that three of the bars broke between 19,225 and 19,811, and one broke at 25,388. This is notable because there are no such erratic results in the other tables. The bars, it must be borne in mind, were all poured from one ladle, and three broke at substantially the same load.

The second set of bars broke at the following strains: 25,897, 27,170, 25,856 and 25,782. The average breaking strain in these bars was 26,176 pounds. The strongest bar varied from the average 3.7 per cent. and the weakest bar varied from the average 1½ per cent., which may be assumed to be a very satisfactory test, the four bars having been poured from the same ladle.

There are also some transverse tests on these same bars. The first test broke at 2208, 2152, 2160 and 2258. The average was 2193. The strongest broke at 3 per cent greater strain than the average and the weakest at 2 per cent. less strain than the average.

The second set broke at 1811, 1729, 1760 and 1789. The average was 1772, the strongest 2 per cent. above the average and the weakest 2.3 per cent. below the average.

I was interested to get these figures and wished to know just how these bars were made, so formulated a few questions, which Mr. Pettigrew has been kind enough to answer in detail, as follows:

Has a round bar cast on end always been your standard?

"We always used square bars until we saw Mr. West's article in *The Iron Age*," showing that the work of the association has been spreading in places we know not of.

The next question was as to the pouring of the bars, and his reply was that the bars were cut in two taps from the same heat. It will be noticed that these bars varied much in strength, the strength of one bar being very much greater than the others. They were poured from the same grade of iron. In every case the molds were green sand molds and they were poured on top.



I next asked if there were any other bars that were poured and not tested. In answer, he says that no other bars were cast at that time which were not included in the tests. The tests cover all the bars that were made.

In answer to my question whether he considered round or square bars the better, he replied that he was not in a position to say yes or no, but that he favored the round bars, as the fracture showed a more uniform grain.

The secretary read the following letter from M. N. McLaren, Jr., of the Edward P. Allis Company, Milwaukee, Wis.:

"At the last meeting of the Western Foundrymen's Association the Committee on Test Bars made its report. The object of this committee, as I understand it, was primarily to accumulate facts which might determine, if possible, the best and therefore the standard form of test bar to be used in general foundry practice. This committee performed its work faithfully, and produced as the fruit of its labor a series of tests with round bars cast on end and square bars cast flat. These data were good enough in themselves, but were not sufficient to warrant the deduction of a single conclusion. Notwithstanding this fact, Mr. West undertook to prove that he was justified in assuming the round bar cast on end to be the best adapted for general foundry use, and furthermore that it might be made to indicate accurately the absolute strength of the material so tested.

"In the rambling discussion which followed, the original proposition of the association was almost forgotten; viz., to establish, if possible, some standard form of test bar. If a letter, with this proposition sincerely in mind, may not be out of place, the writer begs leave to submit the following:

"First of all, can accurate data for the absolute strength of cast iron be obtained by a transverse test? Obviously it cannot. The mathematical formula on which the conversion from strength in flexure to strength in tension is based, depends primarily upon the assumption that the material is absolutely homogeneous throughout. The slightest deviation by the material under test from this assumed condition causes not merely a slight error, but totally vitiates the result.

"Every foundryman knows that there is no such thing as absolute homogeneity in cast iron, and therefore can see at a glance that the formula cannot be applied correctly. If further proof is necessary, the records of transverse tests may be converted into tensile readings and compared with tests of the same quality of metal, made directly in tension. The results will prove astounding. Here is an illustration:

"A few weeks ago I tested a square bar of white iron, 1 x 1 x 12 inches between supports, which broke at 3950 pounds. Converting this result, by the formula, into tensile strength, the metal shows a tenacity of 71,100 pounds per square inch; or dividing the result by the factor 1.4, according to C. Bach, the German engineer, we still have 50,780 pounds tensile strength. The absurdity of this result is apparent.

"Since the tensile strength is only one where the lack of homogeneity does not affect assumption of the formula used in calculating the strength of material, it must be the only trustworthy test, approximating the true absolute strength. But tension machines are delicate and expensive; the time taken to test a piece in tension is necessarily

long and this method is therefore generally conceded to be impracticable for ordinary foundry use.

"The proposition now is just this: Tensile tests are impracticable in the foundry; transverse tests are convenient but utterly untrustworthy so far as accurate absolute results are concerned. Can we make transverse tests answer all purposes in the foundry? In most cases I say 'yes'. In the first place, the foundryman is not an engineer and therefore need not figure on absolute strength of material.

"A comparative test is all he needs and all he would ever use if he has every other appliance at his command. Now, since the results of a transverse test can only be comparative any way, it can make but little difference what the shape of the bar may be, or in what position it is cast, provided the conditions of casting and testing are always the same.

"It is a well-known fact that bars cast flat and tested with the cope side up, break at a higher stress than those tested with the cope side down. There is no mystery about this; cast iron is stronger in compression than in tension, therefore if we put the side with the poorer metal in compression and the better metal in tension, we strengthen the weakest part of the bar and get a higher result thereby. But as long as comparative results are all that are sought it can make no difference whether the bars might break at a different load if turned on a different side, provided they are not turned on a different side.

"To get a test bar that is absolutely homogeneous throughout is an impossibility under any circumstances, and to endeavor to approach homogeneity by casting the bars round, so as to turn off the skin, or in casting them on end to avoid other irregularities, is a superfluous refinement where there are so many other conditions over which there can be no control and which may affect the absolute result sought. It would be as reasonable to pace off a mile or two, assuming that a step was exactly 3 feet, and then to measure the last fraction of a step with a micrometer and give the whole distance down to  $\frac{1}{1000}$  inch.

"When the United States Government or a thorough mechanical engineer makes specifications for a certain strength of material they are always based on tension tests and always will be. And when any question arises as to the fulfillment of any such specification it will always be decided by a tension test, no matter what the refinements of the foundryman's transverse test may be.

"It therefore seems to me to be superfluous to go on refining a method for testing in the foundry which at best can only be comparative and which, if conducted in any of the ways now used, continuously and under the same conditions, will give results uniform enough to base comparisons upon.

"What can refinements amount to under any circumstances when the whole scheme is only a rough comparison, and why should foundrymen bother themselves about perfecting a system which, when perfected even along the lines Mr. West maps out, would not be accepted by a single mechanical engineer in the country as a determining test for absolute results?"

J. M. Sweeney: Mr. McLaren's letter is very much to the point. I take it that all the foundryman finds necessary is to make comparative tests of different mixtures. In order to make these compar-

isons most beneficial to himself he should have the conditions as nearly alike as possible. If the iron cast on end gives better conditions of regularity to himself, that is what he should adopt. The question was not whether the round test bar is a standard to be accepted by engineers for formulas, but which is the best shape of test bars for the foundryman himself in arriving at his best mixtures.

C. A. Sercomb: What we are getting at in the matter of test bars is the relative strength of those cast on end and those cast horizontally. To the foundryman it is a mere nothing, only for his information.

Mr. Sweeney: I do not think our vice-president has stated the question properly. It is, Which is the best for the foundryman to arrive at results? If the round bar cast on end has less flaws and runs more regular than the square bar cast flat, that is what the foundryman wants.

The following candidates for membership were unanimously accepted: Heman R. Powers, Molice Malleable Iron Company, St. Charles, Ill.; Edward J. Fowler, superintendent Fowler Foundry Company, Chicago; Emerson Talcott & Co., Rockford, Ill., and Milwaukee Harvester Company, Milwaukee, Wis.

The secretary read the following paper:

#### Machine Molding.

BY HARRIS TABOR.

A careful analysis of the cost of castings will show that the two important items of expense are pig iron and molder's skill. In a majority of cases the cost of iron is greater, but often more money goes to the molder than to the pig iron dealer. Occasionally heavy and inferior castings are made in which the cost of molding is not so important, but in all cases it is great enough to warrant reduction if possible. Pig iron, sand, fuel and foundry supplies in general are merchantable and are bought from the lowest dealer. There is not a foundryman present who will not give audience to the pig iron merchant if he come with lower prices, or to the coke dealer if he promise a ton of fuel for a trifle less than the cost ledger has been showing, or to the supply man who will deliver sand at a few cents per ton less than the ruling price. But the second item of cost in importance, the molder's skill, is rarely considered except by a reduction in wages, and where the union is strong such reduction is usually preceded by a struggle.

Why does skepticism concerning machine molding prevail? It is because nearly every one has met discouragements in the way of bad castings from good molders, especially when commencing a new line of work with which your molders were not familiar. Such losses have made you doubtful at times of all methods of molding, and especially machine molding. Add to such experiences in hand molding the record of machines which might have done good work if sold with regard to fitness, but did not, and we have the real cause of much of the doubt which exists in regard to machine molding. We may go further and cite the inborn prejudice of the average molder, who has no faith in anything but his own rammer. Such men are often foremen of foundries, and when such is the case their whole influence is thrown against the use of machines. In some localities this prejudice is so great that it is difficult to overcome. In other sections the molding machine has become popular.

Where it has been intelligently placed and used its success has been wonderful, and its future established beyond all doubt.

Success is contagious, and the fact that numerous foundries are doing machine molding with a decided profit is evidence that it is only a question of a short time when the molding machine will take the same place in a well equipped foundry that the milling machine and turret lathe have held for years in the machine shop. It bears the same relation to the foundry that these labor saving tools do to the machine shop, and the economy from its use is quite as great.

The foundry has always been comparatively free from machinery. If we except the blower, the rumbler and an occasional power crane it may be said that the foundry foreman and all his men have had no experience with machinery. This fact has educated these men into a dread of anything which operates independent of the hand, no matter how simple it may be. The manager, knowing this condition, hesitates to adopt new methods until success has been demonstrated elsewhere. On the other hand, the machinist lives in an atmosphere of turning wheels and creaking belts; his whole training has been in the direction of making machinery do his work. Here we have the reason why the machine shop manager is eager to adopt anything which will reduce cost when the foundry manager would hesitate. I will cite two cases to show how naturally the works manager will discriminate in favor of the machine shop. Several of our machines are doing excellent work in a foundry, molding castings which require machining. The cost in the machine shop on certain castings not molded on machines was 28 cents per 100, which was thought too high, and a special tool was designed and built, at a cost of \$3000, to reduce the cost of 28 cents to 25 cents. The foreman of the foundry said if they would give him another molding machine at a cost of \$1000 he would save 75 cents per 100 on the cost of molding these castings. Here a saving in the foundry might have been made 25 times greater than that accomplished in the machine shop, at one-third the preparatory cost. In this case the foundry should have come first. The second instance refers to a machine put in last summer, with the view to equipping the foundry. I will give as nearly as possible the manager's words: "The last saving from the use of the steam machine is in molding small castings which require more time for core setting. On this work the steam machine does for 2 cents the same amount of work that we pay 5 cents for on hand machines, a saving of three-fifths. On larger work, which costs more to mold by hand, 2 cents paid on the steam machine gives us the same quantity of work that costs 10 cents by the old method, a saving of five to one." When the suggestion was made that if he could save one-fourth that amount in the machine shop he would not rest until that department was equipped, he admitted the truth and said he intended to take care of the foundry also. He has since put in the second molding machine and is preparing for more. Such cases might be multiplied did the need exist; they have been introduced to illustrate the hesitancy of the foundry to consider better methods.

All times are favorable to the consideration of economical systems if they

possess merit, and the present especially. The phenomenal growth of this country has made demands upon its manufacturers which have encouraged competition. The result is that prices for all products have been falling until they are now at the lowest point ever known, with no prospect of a full recovery. There may be an occasional boom which will temporarily add to profits, but the prices of a few years ago are beyond recall. We have reached a lower level of values, and so far there has not been a corresponding reduction in cost. A return to normal conditions of trade will not add appreciably to selling prices, for the reason that our producing capacity is ample for such demand, and we cannot expect a substantial advance until all shops are fairly filled. We must face the fact that old prices will not return and we must arrange our plants to suit the new era of values we have entered.

The problem is simple in statement but difficult of solution. Briefly stated it is this: Castings are being sold today at prices little, if any, above the cost of production if all the expenses of business are included. This is especially true of competitive work, made in quantities. The decade ending with '92 was a busy one in the iron trade, and was characterized by a gradual reduction in prices. This period will also be noted as one in which production was largely augmented by new foundries and additions to existing plants; in fact, it was an industrial boom on declining prices. The tendency has been to help the decreased ton profit by increasing the tonnage. A good illustration of this condition is the cast water pipe trade. There has never been a year when the tonnage of cast pipe has been greater than during the past 12 months, and prices have never been so low. These low prices prevail for the reason that the producing capacity is ample for the great demand. Soil pipe manufacturers are doing a fair volume of business at prices which would have meant bankruptcy a few years ago.

The current quotations for castings make the question of labor saving methods an interesting one. You cannot go on melting iron and pouring it into expensive shapes with the present small margin of profit. You do not want to further reduce wages, and it is doubtful if many of you can. What, then, is to be done? Make the product per man greater, with the same effort, by some means, and eliminate the skill required to the greatest possible extent. You must plan with a view to getting greater results from the same physical effort. A little saving here and another there, no matter how small, must be considered. If the gain from these savings yields a larger per cent. on the cost of making them than the money invested in business returns at the end of the year, they should be considered seriously. A saving which seems insignificant in connection with one casting only makes a pretty large aggregate at the end of the year. Such economies are in the right direction and will influence what we are all working for—dividends.

Merchandise, which enters into the cost of castings, has suffered equally in reduction of price. You cannot hope to buy for less, relatively, than you are now paying, hence you must look to your foundry management for cheaper methods. The molder's cost is the greatest you have to deal with, and should be considered first. This may be reduced in various ways—such as

better patterns, flasks suited to the work, good follow boards, match plates and molding machines. I will consider only the latter.

The economy from machine molding is usually gauged by the saving in foundry cost over previous methods. This is only a part of the gain. If castings require machine shop fitting their uniform size, when molded on the machine, makes the cost of such fitting less. One user of our machines reported that he was getting the work of ten molders from one machine, operated by two laborers, at a cost of \$2.70 per day, and added that the gain in the machine shop was nearly as great. In this case the castings were shaft boxes, which required no fitting when cast true to pattern. The machine gave this truth—the hand molder varied the size of each mold with his rapping spike.

Quality has a commercial value. Castings uniform in size and neat in appearance command a better price or are more easily sold. Machine molded castings are usually more uniform in weight and neater in appearance than hand molded work. In one New England market machine molded sash weights sell for \$2 per ton more than similar weights molded by hand.

Any system that will allow expansion and contraction of business with the least disturbance in shop management is economical. The capacity of a molding machine is gauged by the number of men operating it. If the flasks are not too large one man will run it economically; if more castings are needed another man may be added with good results, and so on until three and often four men are working one machine profitably. These men have no skill beyond what may be acquired in a few hours, hence they are easily obtained. Here we have a producing capacity which may be set to match the demand without letting skilled workmen go, in depressed times, with the doubtful chance of getting them back again when needed. Briefly, our experience shows that a good power molding machine will make a minimum economy, in the cost of molds, of one-half and a maximum of four fifths, with an incidental gain in quality and foundry management.

What is the limit to machine molding? This question touches a subject that is as variable as human nature. In a general way it may be said that all patterns that will go in a two part flask can be molded on a machine if there is enough persistence in the manager. It has been said that the limit of the milling machine and the turret lathe is defined by the ingenuity of the tool maker. We might say the same of the molding machine. In a well organized foundry where the cost of molding is watched as closely as is the pig iron market, the manager will put patterns on the machine just as long as machine molding is profitable, and when this is done he will be surprised at the shapes he is molding with unskilled help. On the other hand, the manager who seeks to make all his gain by buying merchandise at the least possible cost, often getting goods of doubtful quality, will reach the limit of machine molding where a more progressive man has barely commenced. If you make a study of the cost of castings in other foundries than your own, you will see one manager getting 10 per cent. greater product per molder than another in the same town; if your investigation extend throughout the country you will discover even a greater difference in what constitutes a day's work in differ-

ent foundries; and you will find where the cost of molding is less when special effort has been made, on the part of the manager, to help the men. Such influences affect the limit and profit of machine molding. What one man would unhesitatingly put on a machine and mold successfully, another may hesitate over until doubt carries the day. Where one man will make a special effort to save 10 per cent. in labor cost another will not be tempted by a gain of 50 per cent., if such gain mean a change in methods. The possibilities of machine molding are much greater than is commonly believed, but these possibilities must always be just what the manager makes them, and no man can safely predict the largest measure of success without some knowledge of the manager's disposition.

You will ask: "What is the cost of patterns?" This question cannot be answered definitely, for the reason that cost varies with different patterns. It may be said, however, that a machine pattern, with stripping plate, always costs more than a like pattern for hand molding, but this pattern cost should be carried through the year, like any investment, to determine its real value, and the pattern which gives a ton of castings with the least pattern charge must be the cheapest. A pattern on a good molding machine will give from two to ten times more castings than can be obtained from a pattern in the hands of a molder—a gain much greater than the difference in cost of patterns.

An important factor in machine molding, and one that is not fully understood, is the duplication of castings. We have always treated this question in relation to the number of castings to be made from one pattern, without reference to the cost of molding. This is a mistake. It follows that castings which are molded for a fraction of a cent each must be made in larger quantities, to give the required duplication for machine molding, than castings which cost one dollar per piece to mold; hence in discussing this feature we should bear in mind cost rather than quantity. If we do this, we soon discover that castings heretofore believed to be beyond the reach of a power molding machine are really the most profitable work that can be put on one. Nor should duplication be considered in relation to time. If you have a number of patterns, from each of which you make enough castings to keep a machine running one day per week, the conditions are favorable for machine molding, and a machine would be as profitable on such work as one running constantly on one pattern. The time needed for changing patterns is short, and the change may be made after the molding for the day is finished.

I have in mind a machine which is molding hydrant bases and 8-inch spigot end gate valve cases. On account of the difficulty in getting cores, these patterns are changed twice daily. This machine is what we term single—that is, it molds only one part of flask at an operation, thus making an additional change from drag to cope with each change of patterns—in all, four changes per day. Two molders operate this machine, with a third molder for core setting. These men handle the sand with shovels, set their cores, pour their molds, and, in fact, do all the work usually done by molders, and turn out a daily product of 70 molds. When these castings are molded by hand, seven are a day's work. Here is an actual gain, from one machine, of the cost of seven molders, and under con-

ditions which have not been considered favorable from the common standpoint of duplication. If this machine were operated by two laborers there would be additional gain enough to pay a good profit on its cost. The parties using this machine installed the first one somewhat over a year ago and have since put in three more.

What has been said of duplication of patterns may be applied to flasks, if the molding machine is adapted to take different sizes and shapes. Where there is enough work to warrant a full complement of flasks of one size, it is better to have them; but if your trade is better served, or economical conditions are favored by molding in two sizes of flask daily, there is no reason why you should not. You may even change from square or rectangular flasks to round, if you keep within the ramming capacity of the machine. This plan will not only keep down the number and cost of flasks where your work is limited, but it will insure your flasks being poured daily, and it will allow you to cover a range of work with one machine which would require two of the type limited to one size of flask.

Power molding machines have been in use for a number of years, but until a comparatively recent date have not been seriously considered, except in a few special lines. There has been a twofold reason for this: 1. Machines have been too special and have lacked the adaptability that is necessary to give the full measure of success. 2. They have not always been widely placed. The latter fault may have been due to an enthusiastic salesman or lack of knowledge on the part of the buyer; but, from whatever cause, it has worked against the use of power molding machines. If you have small screws to make in large quantities you would not think of purchasing a 30-inch lathe to make them on, for your experience has taught you that such a tool, no matter how excellent, is not suited to the work. You must make these screws as cheaply as your neighbor across the way, and for less than you can buy them, which means the purchase of an automatic screw machine of modern design. In considering molding machines for your foundry you must discriminate quite as carefully. If you make the mistake of putting in a 24-inch machine when your work calls for 12 x 16 inch flasks, your introduction to machine molding may be very unpleasant; and the man who attempts to sell you another machine will have a discouraging task. But if you select wisely the chances are that you will become an enthusiastic advocate of machine molding in your own foundry.

The common acceptance of molding machines associates them with small castings which are cheaply molded. Herein may lie the cause of many failures due to lack of adaptation. Many of you have probably seen molding machines on small work giving a doubtful economy, when these machines might have earned their cost each year if molding larger and more expensive castings. In some parts of the country where competitive piece work has not reduced the cost of molding, these same machines which you saw molding with scarcely no profit would give better results. In both cases machines might be put in under the impression that they were suited only to light work, when there were plenty of castings which they would mold to a better advantage.

Bench molding is cheap molding; it is usually done by apprentices and men trained only to this branch. This class

of work is well suited to machine molding if the machine is quick in operation and does not call for too many operatives. You will not be satisfied with anything that will save you only the difference between the cost of skilled and unskilled labor; you must have something that will give an increased product, per man, as well. This a good molding machine will do. Not only on your bench work, but on all castings suited to machine molding. But when you find a small machine that will mold a complete flask, 12 x 15 inches, at one operation and will give you from 30 to 40 molds per hour, depending on core setting, from two men, you must not expect the same number of molds in flasks nearly twice as large, when this same machine is molding one part of flask at an operation. If you use the same care in considering the application of machine molding to your foundry that you give to improvements in your machine shop, the chances are that you will make no mistake.

The fear of labor disturbance has done much to prevent the use of molding machines. That this fear has been greatly exaggerated is proven by our experience. We have machines running very successfully in 13 States, in Canada, Mexico and New South Wales. The number placed in each foundry will vary from one to ten. We have watched this labor question very carefully, and up to date we have not heard of an instance where opposition to the use of machines has been urged. We have machines all through the country operated by laboring men in union and non-union foundries, and, strange as it may seem, we know that in four foundries the machines are run by union molders.

While the molding machine has not received its deserved recognition in some parts of the country, its use in other parts has established its future. It is beyond experiment, and may be classed with the electric crane as a necessary part of the modern foundry equipment. It may not be applicable in all cases, but you will find, by investigation, that the conditions necessary to its success have been greatly exaggerated.

The secretary also exhibited two large drawings of the Tabor molding machine, and said that he had received a letter from Mr. Tabor in which he told him that the drawings were one-half the size of two of the smaller machines.

Geo. M. Sargent: The question is whether molding by machine cannot be made more economical than by hand. We have never had any difficulty in getting men to run our machines, and in making brake shoes we find it a great advantage to do the molding by machine.

W. T. Warner: Any foundryman with a machine that makes duplicate castings, who can turn out double the number, could show a large saving. But to the foundryman with a jobbing shop it would not pay. I do not think the percentage of saving is quite as large as Mr. Tabor says, but there is certainly a saving of one-third in the general run of the work.

J. M. Sweeney: Many people are not familiar with molding machines. I like to know their weak points and get the benefits. Mr. Tabor suggests that they can be extended to a use that has not been contemplated. I thought it would apply to small castings rather than to the casting of which you are only making singly a piece. That view has been entirely



eliminated from my mind since reading this paper.

J. T. Rowlands: I must say I have not had much experience in these machines. I have an entirely different rig in our shop. I am thoroughly convinced that we have got to put in machinery. Other concerns that compete with us are doing it and we must do it also.

G. M. Sargent: We make as large castings as car couplers on our machine. We have a special machine for this work.

L. D. Rosenheimer: Our experience with molding machines has been very slight. We have tried one or two machines and we have not been very successful in operating them. We have not tried the Tabor machine, although where one has duplicate castings to make it is the proper machine. We

It is a class of machine that is not generally used and about which many of us know very little.

A. M. Thompson: I have been in shops where they have been used to a very large extent, and have made my own observations. I have in mind Mr. Sweeney's remark that his conception of the machine was that it could only be of value where a large number of castings were to be made, but he implied that castings could be made to advantage in limited quantities. Castings cannot be made in small quantities profitably on a molding machine. There must necessarily be orders that run into the thousands before they can be employed to any advantage. It is very costly to get up the patterns. The stripping plate is very costly. It takes a long time to make a stripping plate to fit the patterns. The machine itself

E. H. Walker: We have used something that I could hardly consider a machine. In fact, the Tabor machine is the only machine that can be considered an out-and-out molding machine. We have devised several machines in our foundry that give us very satisfactory results. The cost of fitting up the patterns is not much more than for any mold. The plates are simply made and enough space is left to hold type metal.

A. M. Thompson: In speaking of the cost of the stripping plate I had reference to the iron plate complete. I think a plate filled up with type metal that would have to be changed often would be liable to get broken.

G. W. Sargent: We have a new kind of flask that can be taken apart and easily made longer or shorter, and I think it will be a great deal of saving to us.

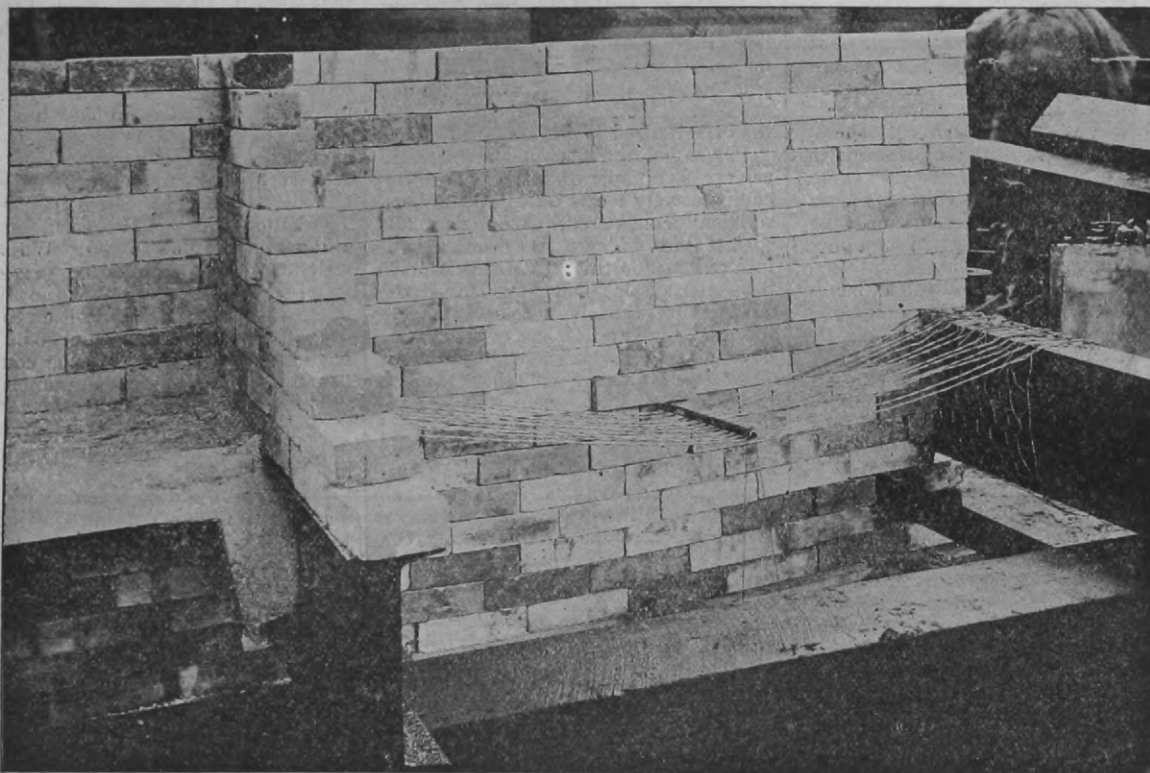


Fig. 1.—Fire Proof Floor.

#### THE METROPOLITAN SYSTEM OF FIRE PROOFING.

have a Reynolds machine that we are working on certain castings, and they can be produced at one-half the cost of those made by hand. There are a number of castings that we have to make by the hundred thousand. A piece workman's price would be too high. It is not necessary that the operator should be a molder. They are really boys ranging from 17 to 18 years of age, and their work is just as satisfactory as that of a man who has been a molder for 10 or 15 years.

W. N. Moore: We have had a little experience with a very simple molding machine, and that is the Reynolds machine. It is hardly entitled to the designation of a machine. It performs but a small part of the function of molding. Our experience with it has been that it is adapted to make small castings in very large quantities. It is generally regarded as being of value where the work can be made by shop help. The Tabor machine is really entitled to the designation of a machine.

is a costly article. In order to pay the interest on the investment and power to run it, it is necessary that the production should be at least twice as much as the ordinary molder would make.

W. M. Moore: May I ask Mr. Thompson to make an estimate on the cost of preparing a stripping plate and patterns—that is, approximately. Would it be \$100 or \$500?

A. M. Thompson: I should think it would take a machinist about four days to finish up the stripping plate, including the filing down to fit the patterns and fill out the patterns to fit the machine.

W. M. Moore: Then you would estimate the cost of the stripping plate and pattern not to exceed from \$25 to \$40?

J. T. Rowlands: In regard to stripping plates, I took particular notice of them as made in another foundry and I think they can be made very cheaply. It is simply a matter of going around the pattern and this can be done very easily with type metal.

J. M. Sweeney: I was in hopes, if I kept quiet long enough, to find out what I wanted to know. I said my impression originally was that a molding machine was not adapted to large quantities; but I mean a number of small pieces put in one flask, rather than where one piece could be put in one flask. What I want to know is if the molding machine would be equally useful if there is one large piece filling up the flask as if the flask was filled with small pieces.

G. W. Sargent: We have one machine for molding couplers which weighs about 200 pounds.

The meeting then adjourned.

The Cleveland Tin Plate Company, Cleveland, Ohio, have sold their machinery and trade mark—"Buckeye"—to the Britton Rolling Mill Company of that city, and have discontinued the business of manufacturing tin plates.

### The Metropolitan System of Fire Proofing.

The method of making a fire proof floor, according to the system of the

These cables are given a uniform deflection by being passed under bars in the center of the spans. The brads to be provided for govern the distance between the cables. Under the cables are placed forms or centers, upon which

been designed, and as its surface is level with the tops of the beams a working floor is thus furnished.

The arrangement employed where a flat ceiling is desired is shown in Fig. 2. In this case the floor plate is the

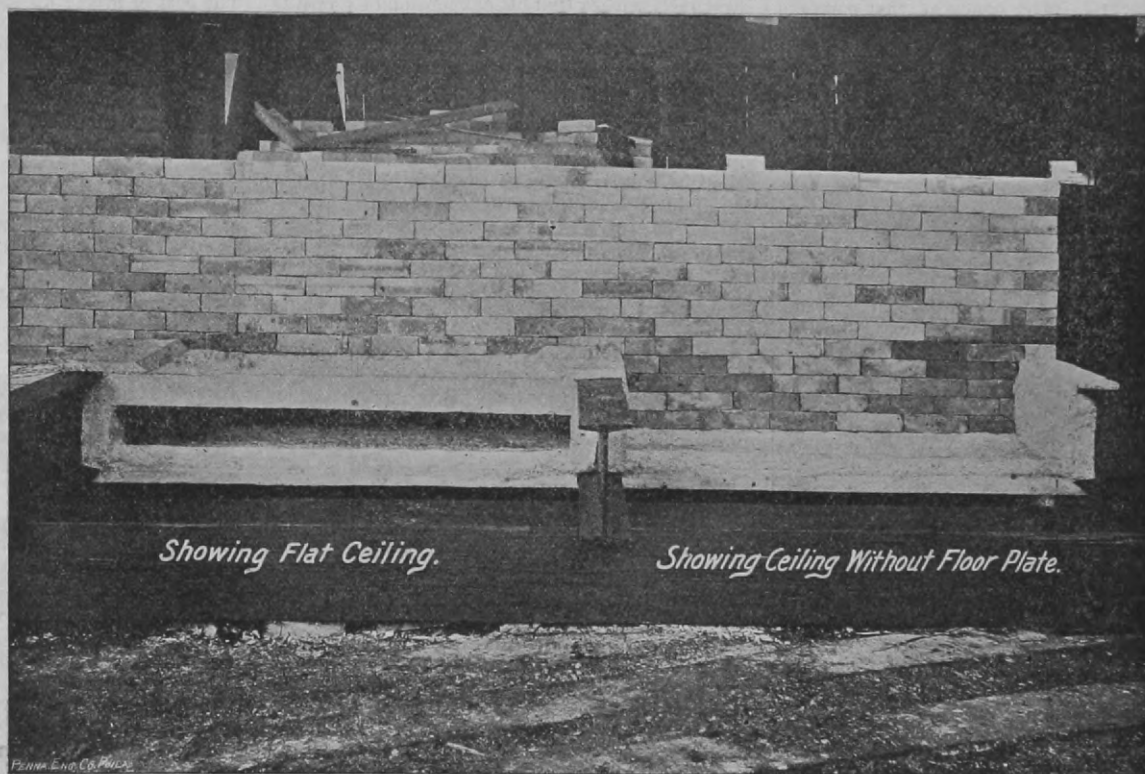


Fig. 2.—Flat Ceiling.

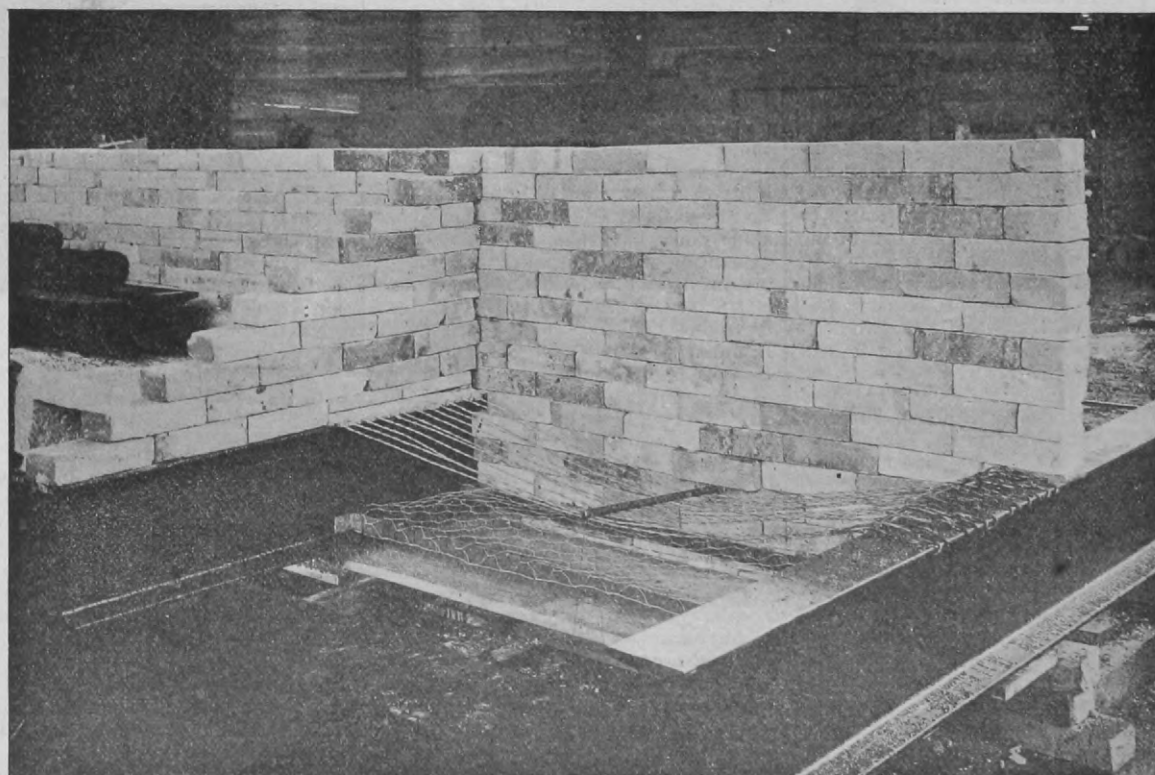


Fig. 3.—Flat Ceiling.

#### THE METROPOLITAN SYSTEM OF FIRE PROOFING

Metropolitan Fire Proofing Company of Trenton, N. J., is as follows: Cables composed of two twisted galvanized wires are placed at certain distances apart over the tops of beams and transversely with them, as shown in Fig. 1.

is poured a composition made principally of plaster of paris and wood chips, which solidifies in a few minutes, after which the forms can be removed. This floor is strong enough to be used at once under the loads for which it has

same as in Fig. 1. The ceiling plate is formed as follows:

Bars are placed upon the lower flanges of the beams and on these wire netting is laid, as shown in Fig. 3. Centers are placed 1 inch below the beams and

the composition is poured thereon. The centers are then removed and the ceiling thus made is ready for plastering. This ceiling is itself capable of carrying considerable weight, but is independent of the floor plate; consequently if the floor plate is deflected by an overload the ceiling plate is not disturbed thereby. In the hollow space between the floor and ceiling plates may be placed pipes, ventilating tubes, wires, &c. This air space is not necessary for deafening, as that is sufficiently effected by the upper plate alone. When the ceiling is flat, as in Fig. 2, and also when it is not flat, the webs of all beams are covered with about 3 inches in thickness of the composition, which thoroughly protects the beams from the effects of heat.

One of the essential advantages of this system is the fire proofing of beams, which this material effects with certainty. The composition is such a remarkable non-conductor of heat that a moderate thickness of it prevents the passage of nearly all warmth. Beams have remained cold, and consequently unaffected, during severe fire tests, while in some cases beams covered with tile or brick arches have been so affected by heat as to deflect and allow the arches to fall before the flames reached them. Flame attacks this composition to a depth of from  $\frac{1}{8}$  to  $\frac{1}{4}$  inch, the remainder being unaffected. When water is thrown upon the hot mass it does not crack or fly. Under the most severe tests this composition has shown its great fire resisting qualities. The convenience of its application and the wide range possible in its employment constitute unusual advantages.

#### Duluth News.

Developments on the west end of the Mesabi range, further west than any one has before found iron in any quantity, are being carried on by the firm of Bennett & Longyear, and some most gratifying results have been had. In addition to this firm, Hibbing & Trimble and some others of Duluth are exploring in the same vicinity, and there promises to be as great a surprise in that part of the range as there has been at the town of Hibbing, though of course no such quantity of ore is likely to be shown.

Bennett & Longyear have two well developed ore bodies. One is in section 29, town 58-20, where there is an estimated quantity of 4,000,000 tons of Bessemer ore, averaging 63.86 iron and 0.029 phosphorus, computed from some 13 analyses, as well as some 1,000,000 tons of brown ore averaging 58.45 iron and 0.059 phosphorus. There is a surface on this ore of 31 feet of drift. Another property on which ore has been found by this firm is still further to the west and lies in 7-57-21. This is estimated to contain 7,500,000 tons of Bessemer ore and about 3,000,000 tons of non-Bessemer. Of the Bessemer, over 5,000,000 tons lies in a channel averaging 74 feet thick and covered with 36 feet of drift, which is figured as being profitable to strip. This ore averages 64.25 iron and 0.043 phosphorus.

The two roads that carry ore to Ashland from the Gogebic range are making arrangements that plainly show that they are expecting a greater business the coming year than for several seasons, if not for ever. They are to raise their ore docks, and the northwestern road will extend its large dock several hundred feet. There is also a project that will, if carried out, build another railway from Duluth to the Mesabi and another dock at that city. So far,

however, there is no certainty of this project carrying.

The Colby, the original big mine of the Gogebic, is to be wrought the coming season with a vigor it has not seen since the days when Captain Joseph Sellwood was at the head of the lessees, if report is to be believed. The Cleveland Iron Co., of the Marquette range has made a discovery of ore near its Lake shaft that is proving large and valuable. It is but a few inches from the surface, and is being extensively tested.

#### Hendricks Brothers.

The *Shipping and Commercial List and New York Price Current* has entered upon its 100th year of existence. An appropriate feature of its last issue is a series of sketches of old New York business firms. The second mentioned is the house of Hendricks Brothers, founded in 1764. We reproduce below our contemporary's account of the history of the firm:

In the review of the material progress of the country during the past century, and of the men and firms who have aided conspicuously in making New York what it is to-day, it will be noted that almost invariably the most solid and promising houses had small, sometimes even humble, beginnings, and that from the first they have been built not upon accident or luck, but by perseverance, industry and square dealing, backed by progressive brains. This is especially true of the house of Hendricks Brothers, one of the very few firms whose names, associated with the early history of the country, come down to us to-day as a vital, active factor in our commercial life. This great house antedates American independence by nearly a quarter of a century. Let the mind run back over the last 130 years, with their freight of wars, panics, disasters—the black background of the grand panorama of human progress—and well may one marvel at the stability of a house that through all has preserved its equilibrium, and not that alone, but has renewed its strength generation after generation without going out of its own family. The business established in 1764 by Uriah Hendricks is to-day held by a firm composed of Edmund, Francis and Harmon W. Hendricks, descendants in a direct line of the fourth generation from Uriah, and Henry H. and Clifford B. Hendricks, sons of the fifth generation. It is rarely that outside of the oldest industrial centers of Europe so honorable and successful a business history as this can be found, a record alike creditable to New York's financial history as well as to the family itself.

In the first directory of New York is found the name of Uriah Hendricks, and his business is classified as "iron-monger," by which name dealers in metals were then known. His first business place was in Hanover Square, then the financial and social center of New York.

Uriah Hendricks was the son of Aaron Hendricks, who came here from Holland among the earliest settlers. The Hendricks family grave plot can still be seen in the picturesque old cemetery in Oliver street.

In the olden time the business of dealing in metals was a most important one. The colonies manufactured nothing themselves—everything was imported from other countries, notably copper and sheet iron, the latter from Russia. From the first the firm had

important dealings with the Government. Most of the old warships whose deeds contributed so much to the maritime glory of our country in early times were covered and fastened by copper furnished by Hendricks. In the olden time also immense quantities of copper were used in the shape of bolts for building vessels. The introduction of steamships and locomotives made a new use for copper. For a long time copper was used exclusively for the steam boilers of the former, and for the furnace sheets and flues of the latter when wood was used exclusively for fuel. In 1812 Harmon Hendricks built the first copper rolling mill in the United States. It was known as the Soho Copper Works and was located at Belleville, N. J., and was but an infant in size compared to the great works the firm have there at the present day. At first foreign copper was used, but since the development of the American mines native copper has taken its place. It is rolled into sheets of all sizes and thickness for commercial purposes.

Their warehouses in the city have suffered in the past from the great fires in New York, and the rolling mills at Belleville were destroyed by fire in 1874, but with characteristic energy they were rebuilt and running full capacity in the remarkable time of eight weeks. In addition to their mills the firm follows the old business, and is one of the most extensive importers and dealers in metals in the country, at its warehouse, 49 Cliff street. Strange to say, some of the correspondents in Europe of the present firm are descendants of the original correspondents, the business not only in New York but elsewhere having been handed down the generations.

A plan to replace platinum by aluminum for leading-in wires for incandescent lamps has been suggested by Werner Bolton, who exhibited lamps made with the substitute at the recent meeting of the German Electro-Chemical Society in Berlin. The coefficient of expansion of aluminum is much larger than that of glass, and direct sealing-in is impracticable. The joint between glass and metal is, however, made in the following ingenious manner: The aluminum is heated in a glass tube until it fuses and the envelope of glass fuses round it. When the composite rod cools the glass cracks; but this is of no moment, as the function of the glass is merely to prevent the aluminum melting when it comes to be sealed into the thick glass envelope which ultimately forms the base of the lamp. The joint between the glass and the aluminum is made tight during the exhaustion of the lamp in the following manner: It is a well-known fact that aluminum when amalgamated by contact with a solution containing mercury oxidizes rapidly, becoming covered with the oxide alumina in the form of a dense powder. This incrustation of oxide, if caused to occur between the aluminum wires and the glass into which they are sealed, is said to make an air-tight joint. These properties are given effect to by applying a drop of a strong solution of mercuric chloride to the outer ends of the wires during the exhaustion of the lamp. The liquid is sucked in between the wires and the glass, and causes the amalgamation of the surface of the metal and its consequent oxidation, the oxide being tightly inclosed and forming an air tight lute. As soon as the joint is tight the ingress of air is, of course, prevented, and oxidation ceases. Should a small leak



occur it cures itself by the action of the oxygen on the remaining aluminum amalgam, resulting in the production of a further supply of luting material precisely at the point where it is needed.

Tests of Boiler Plates.\*

At a recent convention of delegates of the united societies of boiler inspectors, at Eisenach, Germany, Director Otto reported on the work of the commission for the purpose of testing old boiler material.

The following is an extract from the report published in the organ of the united societies of boiler inspectors:

higher in phosphorus. Possibly the manganese and carbon were responsible for this phenomena. At any rate, the commission drew the conclusion from this fact that it must be considered a mistake to prescribe or specify a maximum or minimum of the one or other chemical element.

The experiments made with the plates at blue heat are important as proof that wrought iron, just like boiler steel, has its ductility very much impaired at blue heat.

The opinion of the commission that it is a mistake to specify the chemical elements within narrow arbitrary limits is no new revelation to those who use large quantities of wrought iron or

& Tin Plate Company, Cleveland, Ohio, and it is expected that the production of black sheets will be begun by April 1 next. The company will operate this department of their works first, confining their product to a superior quality of black sheets for tinning. Later on the manufacture of tin and terne plates will be taken in hand. The buildings now in course of erection are a hot mill building, all steel, 105 x 175 feet, and a combination building containing the annealing, pickling, cold rolling, tinning and warehouse departments, which will be all steel and brick, 105 x 168 feet, with a wing measuring 48 x 48 feet. The buildings are being put up by the Shiffler Bridge Company of Pittsburgh.

Chemical composition. Per cent.							Number.			Standard test.	Once cherry heat.		Thrice cherry heat.		Once white heat.		Thrice white heat.		Blue heat.		Bent while blue hot and straightened, slowly cooled and then tested.	Tested while blue hot in a few seconds.	Remarks.
Carbon.	Silicon.	Manganese.	Phosphorus.	Sulphur.	Copper.						Slowly cooled.	Quenched in water of 50°.	Slowly cooled each time.	Quenched in water of 50° each time.	Slowly cooled.	Quenched in water of 50°.	Slowly cooled each time.	Quenched in water of 50° each time.	Slowly cooled.	Quenched in water of 50°.			
0.256	0.050	0.160	0.060	0.017	0.087		I	Strength....	Length-wise.	58,300	60,720	85,460	61,430	68,540	60,000	86,800	58,300	92,570	61,290	66,970	68,960	66,800	Elongation, per cent. in 8 inches.
								Elongation..	Cross-wise.	18.6	18.6	12.6	19.1	18.1	10.7		18.7	7.0	17.6	17.2	15.5	17.7	
								Strength....	Length-wise.	60,000	60,710	80,480	58,870	69,250	20,430	81,330	57,800	87,870	60,570	67,250	68,400	6,313	
								Elongation..	Cross-wise.	21.9	21.2	9.2	23.2	17.2	21.3	13.1	21.2	5.2	19.3	18.0	15.8	18.2	
0.050	0.060	0.270	0.240	0.107	0.172		II	Strength....	Length-wise.	51,900	54,310	56,900	51,500	59,150	51,500	59,700	51,900	60,430	51,760	53,890	56,900	60,400	Elongation, per cent. in 8 inches.
								Elongation..	Length-wise.	20.0	21.0	9.5	20.5	17.5	21.5	14.5	21.5	15.9	19.3	22.7	10.9	11	
								Strength....	Cross-wise.	51,050	54,900	58,900	50,270	60,300	47,800	57,300	47,600	58,100	49,000	46,900	50,200	54,200	
								Elongation..	Cross-wise.	12.1	14.1	7.8	10.6	7.0	11.5	9.0	15.5	10.0	12.6	8.9	7.9	8.4	
0.100*	0.080	0.120	0.085	0.013	0.063		III	Strength....	Length-wise.	51,480	51,330	70,670	51,190	64,840	60,200	72,660	47,350	71,240	52,900	53,890	53,320	47,700	Strength in pounds per square inch.
								Elongation..	Length-wise.	28.2	30.0	10.8	25.0	11.5	26.0	10.5	28.0	12.5	24.5	23.5	14	23.5	
								Strength....	Cross-wise.	51,610	52,610	71,520	52,180	73,370	50,620	71,520	50,900	71,520	54,170	54,000	54,740	50,000	
								Elongation..	Cross-wise.	21.2	18.5	13.5	23.5	9.5	22.5	6.5	21.0	8.5	14.5	20.5	9.5	24.0	
0.171	0.135	0.180	0.070	0.004	0.073		IV	Strength....	Length-wise.	50,530	50,900	70,600	47,200	61,500	49,300	63,560	50,190	59,000	51,580	51,470	51,580	56,900	Strength in pounds per square inch.
								Elongation..	Length-wise.	15.0	21.1	8.5	20.0	7.9	26.1	11.2	18.2	7.6	14.2	22.0	12.5	13.1	
								Strength....	Cross-wise.	47,350	51,900	53,700	58,340	62,000	49,600	58,600	48,000	59,000	49,800	50,330	50,330	54,170	
								Elongation..	Cross-wise.	10.2	19.6	8.7	14.7	8.7	18.8	3.5	19.6	5.2	13.6	16.2	11.2	11.1	

Seventy-one fire box, barrel and flange sheets of wrought iron have been tested thus far for strength and ductility, lengthwise and crosswise the plates, including also chemical analyses.

Comparison with the results of tests of the same material before it was put in service showed a decrease in strength, although it was not very much, however, in comparison to the decrease in elongation.

Very interesting are the results of tests of four new fire box plates as given in the accompanying table.

A comparison of the results of tests of Plates II and III is very instructive. Plate III has the least percentage of phosphorus and manganese, but is high in carbon. In Plate II the first two elements are high, but the carbon is low. The tensile strength of both plates is nearly alike.

It is very remarkable that the various methods of mechanical treatment affected the plate low in phosphorus much more unfavorably than the plates

steel for the making of boilers. Taking into consideration how little is positively known of the actual influence on the life of a boiler plate of the small percentages of chemical elements with which specifications attempt to deal, and how little is also known of the relation to one another of the chemical elements of that material and their influence on the boiler material under the varying conditions this material is subject to, then the position which the commission has taken on this point can be easily understood and appreciated. All the more so since it is practically impossible to determine to what degree the specified chemical elements have changed their form and consequently their manner of influence, during the repeated heating, often very high, and mechanical working of the iron or steel until the boiler is ready for service. No doubt, however, such chemical specifications look well on paper.

Work is progressing satisfactorily and rapidly on the new black sheet mill and tin plate plant of the Crescent Sheet

The Rankin & Fritsch Foundry & Machine Company, St. Louis, are supplying four Corliss engines; the Frank-Kneeland Machine Company of Pittsburgh are making four stand of hot mills, and four cold mills, roll lathe, doubling bar, and squaring shears. The Industrial Works, Bay City, Mich., have the contract for the supply of two electric cranes, and the Elwell-Parker Electric Company, Cleveland, Ohio, will furnish a generator to run these cranes, together with 15 arc and 60 incandescent lights. The H. E. Teachout Company, Cleveland, will furnish six tubular boilers 72 inches by 18 feet.

The "Uses of Compressed Air," by Addison C. Rand, which was published in the summer, has met with such a cordial reception that the first edition has been exhausted and the second edition is about to appear. Mr. Rand's book did not treat of the technical uses of compressed air, but gave a practical account of the various uses to which air has so far been applied.

\* From the Zeitschrift des Vereins Deutscher Ingenieure, November 3, 1894.

## THE WEEK.

Recent rich gold strikes at Leadville, Col., are creating great excitement in that mining town.

The London Rothschilds are said to be arranging a Chinese loan for \$50,000,000 on security of the Chinese customs.

A press cable dispatch from Lisbon states that the Portuguese Government has decided to construct a navy, and with this object in view the sum of \$600,000 yearly will be provided for 20 years. Tenders will be invited from shipbuilders in the United States and other countries.

The Massillon, Ohio, district miners' organization issued a statement on Saturday that the miners accepted the recent award of the Board of Arbitration under protest, reserving the right to ask for a new settlement when opportunity offers.

Secretary Herbert, acting on the recommendations of the bureaus of Steam Engineering and Construction, has decided to contract for the building of a submarine torpedo boat of the Holland type.

Immigration into the United States during the year just closing, judging by the reports of the Bureau of Statistics for the first 11 months, will be barely 250,000, or not more than half the average annual immigration for the past 25 years. So far, this year's immigration has been 233,890, as against 486,270 for the 11 months of last year ending November 30. The recent condition of depression in trade and industry is accountable for the falling off.

Judge Carpenter, in the United States Circuit Court at Boston last week, declared the telephone patent issued November 17, 1891, to Emil Berliner, as assignor to the Bell Telephone Company, to be void, and ordered that the papers should be delivered up to be canceled. The patent was attacked by the Government on the ground that a patent covering substantially the same invention was issued in 1880, and that the issue of the patent of 1891 was wrongfully delayed through various proceedings of the Patent Office. The Berliner patent is, next to the Bell patent, which has expired, the most important patent ever possessed by the Bell Telephone Company, as it covers the use of the carbon or microphone contact, used in the long distance transmission of speech. An appeal will, it is stated, be taken from Judge Carpenter's decree.

Some Baltimore capitalists have secured letters of incorporation for a company who propose to utilize the water of the Susquehanna River as a means of generating electric power, to be transmitted to Philadelphia, Baltimore, Wilmington and other points. The incorporators of the Susquehanna River Electric Company are: Moses A. Houseman, Geo. K. McGaw and Winfield J. Taylor of Baltimore, and Chas. R. McConkly of Peach Bottom, Pa. It is proposed to dam the Susquehanna near Conowingo, Md., and to erect there a large electric power house similar to that at Niagara Falls. Large tracts of land have been purchased near Conowingo and the surveys have been completed for a very extensive plant. Work, it is announced, will be commenced on the dam as soon as the spring freshets are over, and is ex-

pected that the company will be able to furnish power to their subscribers by January 1, 1896.

A company of Western capitalists has been incorporated to seek for the wreck of the steamer "Pewabic," which was sunk in a collision on the lakes 25 years ago. The wreck is known to contain 500 tons of copper, and carried gold valued at \$300,000. It lies in about 16 fathoms of water, but hitherto all attempts to secure the treasure have failed.

The British Columbia sealing vessels have made a record catch this year, bringing in 95,000 skins, valued at about \$1,250,000. Last year's catch did not exceed 70,000 skins.

The trolley mail car system has been extended in Brooklyn.

Arrangements are being made for the holding of a large international exhibition of agricultural machinery in Vienna in May, 1895.

The past season has been a bad one for the carrying trade on the great lakes. Returns of shipments show a material falling off in the shipments of most of the leading agricultural staples, except flour, of which 2,190,385 barrels were carried this season, as against 1,471,060 barrels last year. Of wheat only 14,530,880 bushels were shipped, compared with 19,720,775 bushels in 1893; of corn, 34,946,981 bushels, against 62,967,955, and of oats, 14,968,832 bushels, compared with 22,563,290 bushels carried last season.

The steady growth in post office receipts which has marked the business of that department for many years back was checked this year by the general business depression. For the first time the receipts at the post offices of the principal cities show a slight falling off as compared with the previous year. The following table, published by the Department, shows the gross postal receipts at New York, Philadelphia and Boston for the past seven fiscal years:

Year.	New York.	Boston.	Philadelphia.
1888.....	\$4,021,366	\$1,724,608	\$1,871,889
1889.....	5,430,170	1,857,501	2,031,549
1890.....	6,028,927	2,070,214	2,218,839
1891.....	6,386,521	2,173,450	2,388,205
1892.....	6,771,782	2,374,601	2,573,716
1893.....	7,359,777	2,565,644	2,705,691
1894.....	6,942,873	2,474,771	2,627,031

We are informed by the St. Louis Stamping Company, St. Louis, Mo., that their tin plate plant is now running full on a non-union basis, and turning out plate equal to anything they have ever produced.

Laird Clowes, one of the ablest English authorities on naval matters, has given his ideal of a new type of fighting vessel, a 101-gun ship. What is needed, he says, is great speed, moderately thick armor and numerous quick firing guns. The British have nothing of the kind in their navy, while the French have attempted it in five of their ships. This is Mr. Clowes' picture of the most efficient kind of modern fighting vessel: "A ship of from 10,000 to 12,000 tons displacement, carrying 6-inch steel armor all over her, steaming 22 or 23 knots, and mounting some such armament as 16 6-inch guns, 20 4.7 inch guns, 20 3-inch 12-pound guns, 20 6-pound guns, all quick firers, with 25 Maxims of a caliber somewhat larger than the one in present service use. Then we should have a 101-gun ship, against which no man-of-war in existence could stand up and from which no man-of-war in existence could escape."

## PERSONAL.

An informal reception and complimentary dinner was recently given to Col. W. P. Craighill, Corps of Engineers, U. S. A., president of the American Society of Civil Engineers, by members of the society resident in Philadelphia and vicinity. Covers were laid for 61 guests. The following toasts were responded to: "Our Guest," Col. Wm. P. Craighill; "The American Society of Civil Engineers," Chas. Macdonald; "The Means and Methods of More Firmly Cementing Our Friendship Together," R. W. Lesley; "The Engineering Achievements of the Day," J. C. Trautwine, Jr.; "Iron and Steel," John Fritz; "Our Mechanical Brothers," Oberlin Smith; "The Manufacturing Engineer," James Christie; "Transportation," Theodore Voorhees.

"The Land of the Midnight Sun," is the title of a charming series of letters written by Julia B. Thomas of Catasauqua, Pa. It describes the personal experiences of a trip to Norway made this year, and will be thoroughly enjoyed by the friends of Mr. and Mrs. Samuel Thomas.

C. M. Schwab of the Homestead Steel Works expects to sail for Europe about January 15 on a three months' trip.

The first-class barbette war vessel "Magnificent," the largest British battle ship afloat, was launched at Chatham, England, on December 20. The "Magnificent" has a length over all of 420 feet; extreme beam, 75 feet; mean draft, 27½ feet; displacement, 14,900 tons; speed with natural draft, 16½ knots, and with forced draft, 17½ knots. Her main battery will consist of four 12-inch wire wound guns, mounted two in a barbette forward and two in a barbette aft. Her auxiliary battery will contain 12 6 inch rapid fire guns, and her secondary battery will be composed of 16 12-pounder and 12 3 pounder rapid fire guns. She will have five torpedo tubes, four of which will discharge below the surface. The 12-inch guns will be arranged to be loaded in any position, by either hydraulic machinery or hand power, and they will be protected by 3-inch shields fitted to the turntables so as to revolve with the guns. The "Magnificent" was begun only a year ago, and the speed shown in building her is remarkable. The cost of her hull alone was \$2,812,000.

Galloways, Limited, of Manchester, England, are making for the Johnson Company of Lorain two large pairs of horizontal high pressure non-condensing engines for the blooming mill of the new plant. The *Engineer* gives the following details: The larger engine has cylinders 55 inches bore by 5 feet stroke, with crank shaft bearings 22½ inches diameter, and the total weight of this engine will be about 300 tons. The smaller engine has cylinders 48 inches bore by 4 feet 2 inches stroke, with bearings 19½ inches diameter, and the total weight will be about 200 tons. The pressure at which both will work is 150 pounds per square inch, and it will be seen that the engines are probably as large as any that have ever been made in connection with rolling plant.

The Midland Steel Company, Muncie, Ind., have recently bored a gas well on their premises in that city which produces 7,000,000 cubic feet per 24 hours.

The Iron Age

New York, Thursday, December 27, 1894.

DAVID WILLIAMS, - - PUBLISHER AND PROPRIETOR.  
CHAS. KIRCHHOFF, - - EDITOR.  
GEO. W. COPE, - - ASSOCIATE EDITOR, CHICAGO.  
RICHARD R. WILLIAMS, - HARDWARE EDITOR.  
JOHN S. KING, - - - BUSINESS MANAGER.

The Cost of Steel Billets.

It is a somewhat difficult matter to present any figures of general value in relation to the cost of making steel billets, because the conditions vary with nearly every plant. The heavy decline in prices during the last two years has led many familiar with the work, although not having access to details, to the assumption that many producers must be working at a loss. Sellers as well as buyers in other sections have shrugged their shoulders over the doings of the works in the Pittsburgh, Wheeling or Valley districts. Many have insisted that it must be only a matter of time when they must exhaust their resources. We believe it should be thoroughly understood that with present prices of raw materials the well equipped plants in the central West are still holding their own, while some may contrive to gather in a modest profit.

On the basis of \$10 Bessemer pig we make the following estimate of cost of conversion, calling the waste 15 per cent.:

Estimated Cost of Conversion of Pig into Billets.

Waste, 15 per cent. ....	\$1.50
Ferromanganese .....	.40
Coke .....	.30
Coal .....	.30
Limestone .....	.10
Refractories .....	.20
Molds and Stools .....	.25
Various supplies .....	.10
Repairs and betterments .....	.35
Laboratory and office .....	.15
All labor .....	1.10
Total .....	\$4.75

This does not, of course, include interest on plant, taxes, water supply and a number of smaller items. It does not, however, embrace, on the other hand, any credit item for value of pit scrap and crop ends. It justifies the statement that an estimate of \$5 for cost of conversion on \$10 pig iron is not ruinous to a modern steel plant in the central West, and that therefore the producers in other districts must face the fact that exhaustion does not necessarily follow a brief period of \$15 for common billets at Pittsburgh, or its equivalent in other localities.

There is not, of course, any inducement to rush into the business at these figures, although the very latest plants can probably do somewhat better. It is equally true that makers are entitled to a living profit, so that they can stand the depreciation in value of plant due to progress in practice, and receive fair compensation for risks of all kinds which they must incur.

Refining Lead in Bond.

Some years since American capitalists went largely into the business of smelting lead and silver ores in Mexico. The business developed rapidly, the principal supply of lead ore coming from the Sierra Mojada, while the dry silver ores were drawn from a number of the older camps. Two of the works—La Gran Fundicion Nacional Mexicana, and La Compania Minera, Fundidora y Afinadora—are at Monterey; one, La Compania Metallurgica Mexicana, is at San Luis Potosi; one, the Velardina Mining Company, is at Velardina, and the Compania Minera Constancia is at Sierra Mojada. Another smelter is being put up at Chihuahua. The result has been that the lead production of Mexico has increased very rapidly during the past few years. To some extent this development of the smelting industry in Mexico has been at the expense of smelters in this country, who for a number of years treated very large quantities of Mexican ore. With the expansion of this business, the question came up of refining and desilverizing the metal produced by the furnaces, or the "base bullion," as it is called. Anxious to secure this business, American refiners prevailed upon the Treasury Department to arrange for refining in bond. Under a ruling made in 1892 credit was given on the warehouse bond for the duties on the quantity of the imported crude metals or ores shown by assay, and 10 per cent. of the quantity so shown in addition thereto. In other words, the refiner, when he imports 110 tons of Mexican base bullion for refining and desilverizing in bond, need account only for 100 tons of refined lead when he exports. Of course there is a certain amount of loss in refining, but it is really not nearly as great as 10 per cent. The metallurgical loss is probably somewhere between 2 and 5 per cent., according to the character of the base bullion. Under this arrangement of refining in bond, the works could place on the home market a certain quantity of Mexican lead, duty free, that quantity being represented by the difference between the 10 per cent. allowance and the actual metallurgical loss. This is known in the trade as "exempt" lead. On total importations of, say, 40,000 tons per annum, taking a 2 per cent. metallurgical loss the quantity is 3200 tons of lead. Since the duty on lead is 1 cent per pound, the refiners secured an advantage of about \$64,000 per annum as the maximum, or, roughly, \$1.50 per ton of lead treated. This is supposed to offset to some extent the disadvantages under which they labor in their competition with foreign refiners in the work. The Mexican base bullion reached the Gulf at Tampico, but freights from there to American ports and on the refined lead to European ports are higher than the freight rates on base bullion direct to Europe. Besides this,

it costs more to ship the silver extracted by the American refiner than it does when it is still in the base bullion shipped from Tampico to Europe direct. Then, of course, wages are higher here than they are in Europe. On these grounds the American refiners claim that the industry can only be held by them if they are given the advantage of the 10 per cent. allowance.

Now the Treasury Department has suspended its former method and has reduced the allowance from 10 per cent. to the bare metallurgical loss, making it 2 per cent. on metals and 8 per cent. on ores. It seems pretty clear that this new ruling will simply drive away the business from this country, and will deprive a number of men of work and put an end to the sale of the raw materials necessary in the refining. It will probably stop the work which has been going on in the building of a large refinery at Elizabethport, which was to be used for this particular purpose. We do not see that the change does any one any good, because we are importing foreign lead anyhow, while it does really hurt an industry which we want to keep. The old system should be retained.

The first ray of encouragement to the iron trade from the reports of the earnings of the railroads has come recently. The *Chronicle* reports that during November the receipts of railroads controlling over 100,000 miles showed a decline of only \$730,190 as compared with those of the corresponding month last year. How tremendous the falling off in revenue has been during the current year is shown by the reports for the first 11 months. Our contemporary reports that for nearly 100,000 miles of road the earnings declined from \$489,002,518, in 1893, to \$436,176,239, a falling off of \$52,826,279. We were gathering headway at a rapid rate before last year. In the first 11 months of 1890 the earnings were nearly \$35,000,000 better on 87,000 miles of road than they were in 1889. The following year showed a further improvement to the amount of nearly \$30,000,000. The year 1892 again overtopped this with \$25,000,000. Last year converted that steady increase into a decline of, say, \$6,500,000 for the first 11 months. This year swelled that minus into nearly \$53,000,000. With such a tremendous cutting out of revenue it is not surprising that the purchases of rolling stock and track material have been so meager.

A German newspaper has made an interesting compilation to show how heavily German and Austrian metallurgical concerns write off annually for depreciation of property. It includes such concerns as Rheinische Stahlwerke, Schulz-Knautt Alpine Montan, Dortmunder Union, Hoerde, Bochum Koenigs und Laura Huette Menden und Schwerte, Stolberg Zink, Schlesische Zinkhuetten and Hagen. The average written off on real estate

was 2.14 per cent. for the metallurgical works alone, and 2.96 per cent. for those concerns which had also colliery property. On buildings and workmen's houses the depreciation accounts ranged from 0.77 per cent. to 7.70 per cent. They averaged 2.85 per cent. for the group including metallurgical works alone and 2.88 per cent. for the group which embraced concerns possessing coal mines. On machinery the average is 6.34 per cent. for one group and 3.82 per cent. for the second. On coal washing plant it was 4.95 per cent., and on coke ovens 8.39 per cent. On tools it was 9.95 per cent. and 5.22 per cent. respectively for the two groups, while six concerns in the first group wrote off an average of not less than 37.10 per cent. on the value of the patterns and patents. In our own country so few public companies report that a comparison cannot be instituted. On the whole, however, we are under the impression that the amounts written off for depreciation of property and of plant are not nearly as large, or as generally undertaken.

## OBITUARY.

THOMAS BALL.

Thomas Ball, ex mayor of Worcester, Mass., died suddenly from heart failure on December 19, aged 70 years. Mr. Ball was a prominent civil, consulting and hydraulic engineer, with a large practice in the New England States. He was city engineer of Worcester from 1867 to 1872, and mayor in 1865. At the time of his death he was president of the Union Water Meter Company of Worcester.

G. G. PALMER.

Dr. G. G. Palmer died at Stanhope, N. J., Friday, December 21, in the eighty ninth year of his age. Abandoning the practice of medicine in the early forties, he bought and successfully ran the Pioneer Furnace at Pottsville, Pa. In 1848 he constructed Nos. 1 and 2 furnaces of Andover Iron Company, Phillipsburg, N. J., subsequently operated in Vermont, and rebuilt the Montgomery Furnace. About 1866 he built No. 1 furnace at Stanhope, and subsequently No. 2 furnace, and remained there until his death.

The Lewis Foundry & Machine Company, Pittsburgh, Pa., have just finished shipment of all machinery for the rolling mills of the Atlanta Steel & Tin Plate Company, Atlanta, Ind. This machinery is in all probability the heaviest ever placed in a tin mill, and the Atlanta Company are well pleased with the character and appearance of the work. The Lewis Company furnishes the entire equipment of rolling mill machinery. The rolling mill building of the Atlanta Steel & Tin Plate Company, Atlanta, Ind., is about completed. It is of iron, 80 x 300 feet. The company will be rolling their own black plates about January 1, 1895.

Seventeen firms of manufacturers of bar iron, east of the Alleghany Mountains, met in Philadelphia last week to consider the condition of the trade. A committee to revise the list of extras was appointed. The next conference will be held on the 3d prox.

## CORRESPONDENCE.

### A Method for Obtaining Solid Test Bars Cast on End.

To the Editor: It is not the intention of the writer to here make any apology for the defective test bars which were obtained by members of the Western Foundrymen's Association Testing Committee described in their report of November 21, 1894; he would only say that the last report has proved his ability as a molder to devise a plan that could insure positive results at the hands of any molder. The new methods consist in having the metal enter the molds through a gate whose form gives it a rapid, whirling motion. Any dirt which might mingle with the molten metal is retained in the center portion of the metal as it rises in the molds, thus bringing it up to the top surface of the test bar. The chairman of the testing committee has asked for an increase to the committee, at the writer's request, so as to give the system a most thorough and rigid test, and when the time arrives for final report I think that previous writings and discussions will have fully proven that the round bar cast on end is the only method which can be correctly adopted as a standard for relative tests. The difficulty which had existed in making the adoption of this system practicable, being that of a question of flaws, is now wholly removed. THOS. D. WEST.

### A Big Magnet.

Probably the largest electro-magnet in the world has been constructed by Lieut.-Col. R. W. King, the commandant of the Government station at Willott's Point. It is made of an old Rodman gun, many miles of covered cable, and is excited by the current from two dynamos. Around the barrel of the gun, which is of cast iron, has been wound 14 miles of insulated cable. The armature consists of six platform plates bolted together. When charged, the magnet will support five 325 pound cannon balls, suspended like a chain from the muzzle. From the New York Sun we take the following:

When the first one was hoisted within control of the magnet it sprang to the gun with a thump. As each cannon ball was moved toward the one above it, it sprang up and clung so fast that it could not be pulled away. For convenience in lifting these heavy weights within the influence of the magnet an iron pulley with  $\frac{1}{2}$ -inch chain was used at first. It was found, however, that when the gun was magnetic the chain and pulley were of no use. The chain became as rigid as if it had been a bar of solid steel and was riveted to the gun.

Another interesting experiment that has been made with this magnet seems even more wonderful to the layman than the grip on the armature. A soldier standing 3 or 4 feet from the gun, with his back toward it, places an iron spike against his breast, and it stands out as straight as if the man himself were a magnet. The man then covers his chest with iron spikes until he looks like a porcupine. He feels no effect from it, and he simply has to resist the pushing of the iron spikes, which are very anxious to reach the gun. When the current is on, the whole gun carriage, which is also of iron, is charged.

Col. King has plotted out the lines of magnetic force from the muzzle of this

gun. A table was placed in front of the gun and on this were placed a number of small pieces of wire. When the gun was magnetized he found the general direction of the curves of the magnetic force from the way in which the wires pointed.

With its carriage this Rodman gun weighs about 80,000 pounds, and when it was all magnetic there was a good deal of speculation as to the radius of its appreciable influence. Col. King settled speculation on this subject recently. He placed light compasses at various distances from the gun before it was magnetic. They were set with the indicator pointing to zero. The electrical current was then turned on, and the big gun became a magnet. Its power was indicated by the compasses. Col. King found that at a distance of 71 feet the magnetism of the gun equalled that of the earth, and that the indicator was deflected 45 degrees.

At the distance of 200 feet the needle was deflected only three degrees. This should set at rest the fears of foreigners that compasses on vessels six miles away could be disarranged.

Keep's Chart. — The first chart which accompanies W. J. Keep's paper, read before the mechanical engineers, entitled "Relative Tests of Cast Iron," needs correction. The line of series four should go to the sixth line from the bottom at the right hand margin. It should go to the point 0.080 instead of the point 0.128, which it reaches, as printed in the advanced proof issued by the society and reproduced on page 1106 in *The Iron Age*.

The work of copper plating a tug 100 feet long and of nearly 90 tons is now being done in Jersey City by the Ship Copper Plating Company. It is expected that this process, by means of which the hull is covered with copper by electric deposition, will provide a permanent and effective remedy for the evils arising from barnacles. The process, which has been described in former issues of *The Iron Age*, consists in depositing copper on small sections of the hull at a time, the tanks being so made that they can be moved as required and being constructed to fit the curves of the sides.

Nineteen ships of an estimated value of \$2,870,000 are now either under contract in the shipyards of the great lakes, or negotiations for their construction are so far advanced that it is quite probable they will be built to go into commission as early as possible next season.

In the description of the Ferracute cartridge press, our types made the number of cups produced per day of ten hours 40,000. It should have read 400,000.

The Youngstown Bridge Company, Youngstown, Ohio, are engaged in constructing three large movable dams to be placed in the Great Kanawha River. This work is being done for the United States Government.

It is reported that the efforts to form an association of the makers of cold rolled steel in the United States was definitely abandoned this week.

The St. Louis *Republic* reports that the wire rope manufacturers had a meeting in that city last week.



## MANUFACTURING.

### Iron and Steel.

A plan is on foot to reorganize the Akron Iron Company, Akron, Ohio, for some time in the hands of J. A. Long, receiver. A number of creditors have consented to terminate the receivership, and the concern will be under the control of the creditors until all debts have been paid.

The rail straighteners formerly employed at the Edgar Thomson Steel Works, Bessemer, Pa., but who went out on strike some two months ago, have requested that their old positions be given them.

At a recent meeting of the stockholders of the Waugh Steel Mill of St. Louis the proposition of moving the plant to Alexandria, Ind., where the company have been offered 30 acres of land and other inducements, was discussed. It is generally understood that the plant will be moved to Alexandria shortly.

The reorganization of the Woodstock Iron Company of Anniston, Ala., into the Woodstock Iron Works has been perfected, and William G. Ledbetter was elected president, Hoffman Atkinson secretary and James W. McCulloch treasurer. First mortgage bonds for \$25,000 will be issued at once and complete repairs made to the blast furnace.

It is announced that the furnace of the Richmond Iron Company, at Richmond, Mass., is ready to go into blast. It has recently undergone repairs.

The Warren Foundry & Machine Company of Phillipsburg, N. J., have increased the wages of the molders 10 per cent.

The plant of the Aschman Steel Casting Company, Sharon, Pa., has been sold at sheriff's sale at the suit of J. J. Spearman and Norman Hall, stockholders in the concern. The suit was brought about by money loaned to the firm by the persons named above and the plant was purchased by them. It is the intention to change the name and put the plant in operation as soon as matters connected with the same have been arranged.

The Morton Tin Plate Company, Cambridge, Ohio, will operate their three mills under the present scale of wages. Their output will be about 125 tons of "Morton" black plates per week. The company are negotiating for the purchase of four tinning sets.

On the 31st inst., the corporation known as the Laughlin & Junction Steel Company, operating a Bessemer steel plant and cut nail factory at Mingo Junction, Ohio, will cease to exist and will be succeeded by the Junction Iron & Steel Company of the same place, which concern will execute all contracts of the old firm. Captain M. J. Urquhart, who has been with the Laughlin & Junction Steel Company for many years, will retain his connection in the same capacity with the Junction Iron & Steel Company.

The Great Western Tin Plate Company of Chicago have leased the Joliet Sheet Rolling Mill, at Joliet, and will immediately proceed to remodel it for the manufacture of black plates for tinning, adding to it the necessary tinning tanks.

The plant of the Elwood Tin Plate Company, Elwood City, Pa., has been put in operation with non-union men. At this writing the firm have from six to nine crews working, and do not anticipate any serious trouble in getting sufficient skilled labor to operate their plant to full capacity. It is stated there is a very strong disposition among former union men to acknowledge their defeat and take positions in non-union mills away from their former location.

The Lloyd Booth Company, Youngstown, Ohio, manufacturers of rolling mill and tin plate machinery, have received a contract from the Ohio Steel Company, Youngstown, Ohio, to build a bar table about 100 feet long with a very ingenious swinging device. The weight of this table and swinging device will be about 180,000 pounds, and some entirely new features will be embraced in its construction. The Lloyd Booth Company have recently made shipments of two bar shears, and have now in process of construction in their shops four 24 x 32 inch hot mills, four 22 x 34 inch and one 20-inch cold mills.

The small billet mill in the American Iron & Steel Works of Jones & Laughlins, Limited, of Pittsburgh, turned out 300 tons of 1½ and 2-inch billets in one day recently.

The output of billets in the Bessemer plant of this concern has reached as high as 1360 tons in 24 hours.

Some excellent records for production have recently been made in the rod mill of the Oliver Wire Company, at Pittsburgh, the day turn recently making 378,000 pounds, while the night turn made 389,000 pounds of No. 5 rods. This is claimed to be the largest production in 24 hours in any rod mill in the country.

Furnace firms interested directly or indirectly in Mesabi range mines are using quite high percentages of new range ores. At Rosena Furnace, New Castle, 58 per cent. Mesabi is employed and large outputs have been made—1900 gross tons in one recent week, while the average for a number of months has been 1800 tons a week. The Lucy Furnaces of the Carnegie Steel Company also use 58 per cent. of the same ore that is used at Rosena. At Edith Furnace, Pittsburgh, five-sixths of the mixture is Mesabi Mountain. At Girard Furnace, 75 per cent. of Biwabik is used and it is expected that this percentage will be increased. At the Red Jacket Furnace at New Castle, the Mesabi percentage is 16%, and in the majority of merchant furnaces the percentage is in the neighborhood of 25.

It is stated that a number of former employees of the United States Iron & Tin Plate Mfg. Company, Demmler, Pa., and also of Wallace, Banfield & Co., Limited, Irondale, Ohio, who are out on strike, have decided to build co-operative tin plate plants at both the above places. It is stated that free sites have been offered with bonuses, but as yet nothing definite has been done in the direction of accepting any propositions that have been made. It is in contemplation to sell shares for \$250 per share, and not less than ten shares will be sold to any one person.

The Elliott-Washington Steel Company, New Castle, Pa., manufacturers of fine cold rolled steel and hot rolled steel, contemplate making some extensive additions to their plant which will materially increase their capacity and also allow the firm to take up some other lines of manufacture which they have heretofore not pursued.

The Bessemer plant of the Shenango Valley Steel Company, New Castle, Pa., which was idle for several weeks on account of a broken shaft, is again in operation.

The furnace of the Alleghany Iron Company, at Iron Gate, Va., will blow in during the first week of January.

The foundations of the new wire mill at Stirling, Ill., are being completed. The drawing building, three stories high, will be 170 feet long and 80 feet wide, with three rows of benches. The annealing building will be 220 feet long, one story high. The galvanizing department will be 336 feet long by 119 feet wide.

### Machinery.

The partnership heretofore existing between Chas. J. Lang and Manning McPherson, as the Russell Machine Company, Pittsburgh, Pa., has been dissolved and the business will be continued by Chas. J. Lang, under the firm name of the Russell Machine Company.

The McKee & Webb Mfg. Company have been incorporated to conduct a general foundry and machine business, in Cortland, N. Y.; capital, \$15,000, and directors, John L. McKee, Arthur Webb, Thos. C. McKee and Thos. Smith of Cortland.

The Lombard Iron Works of Augusta, Ga., have just completed a new boiler shop. Increased business demanded larger quarters and the employment of a large force of men.

### Hardware.

Ohio Lantern Company, Tiffin, Ohio, whose new oil can with woven wire cushion was described in *The Iron Age* of December 13, have recently started up their new train of automatic machines for jacket weaving, thus, they advise us, doubling their capacity, and the company hope hereafter to be able to ship promptly from stock. They also state that they have in process of construction additional machines which will be finished and running by April 1 next.

F. E. Myers & Bro., Ashland, Ohio, recently purchased the extensive plant of the Ashland Clover Huller Company, including all its equipments, such as machinery, patterns and tools. The plant will be hereafter devoted to the production of the well-known Myers Specialties.

For some time past the Reading Hardware Company, Reading, Pa., manufacturers of

fine builders' hardware, have been running their plant six days per week and eight hours per day. This has not been on account of increase in business, but from the fact that the concern desired to clean up their stock before taking the annual inventory.

The Wise Automatic Computing Scale Company have been organized at Las Vegas, N. M. The capital stock is \$100,000.

C. J. Kimball & Son of Bennington, N. H., have bought the cutlery business of Wilbur Webster of East Jaffray, and will soon remove the machinery and tools to Bennington.

The Duplex Hanger Company of Cleveland, Ohio, are a concern who have been recently incorporated. The capital stock is \$50,000.

Reading Hardware Company, Reading, Pa., whose plant for some months past has been running but four or five days a week, are now running six days a week.

### Miscellaneous.

The Elerslie Coal & Coke Company, Philadelphia, Pa., whose works are located at Winefrede Junction, W. Va., have contracted with the Laclede Fire Brick Mfg. Company, St. Louis, Mo., for 72 gas retorts—i. e., 12 benches of 6's, and are erecting a new brick retort house 66 x 80 feet in size in which to set the same. This addition will double the capacity of the plant for the output of coke, tar and ammonia sulphate.

The H. C. Frick Coke Company of Pittsburgh, are making a test of beams for use around shaft bottoms in place of timber. A trial of them is now being made at Leisnering No. 1 coke plant in the Connellsville region. Mining experts are of the opinion that they will soon replace wood in shaft building.

The Pittsburgh Plate Glass Company of Pittsburgh, have declared a dividend of 4 per cent. on the common stock, making 12 per cent. in all on the common stock for this year.

The Mahoning Valley Electric Railway Company will immediately commence the erection of an electric street railway line from Niles to Youngstown, Ohio.

Theodore Hurtz & Son, St. Louis, Mo., manufacturers of Nonpareil anti-friction metal, report a heavy demand for this metal. They are sending out a small folder describing the metal in full and refer to it as a metal which keeps cool and requires little oil. The folder also has a long list of manufacturers located in St. Louis who are using and who recommend this metal.

The Youngstown Iron & Steel Roofing Company, Youngstown, Ohio, manufacturers of all kinds of iron and steel roofing and siding, recently received an order calling for about 90 tons of roofing, while from the East an additional order has been secured for 70 tons, and from one of the New England States the concern have received an order for 1000 squares of curved corrugated iron. This concern have been in business only a short time, and their plant is being operated to its utmost capacity on orders already received.

On January 1 the Thomas Brass & Iron Company will remove from Milwaukee to their extensive new plant at Waukegan, Ill., where they have completed a machine shop 400 x 80 feet, a boiler house 144 x 40, an iron foundry 250 x 60 and a brass foundry 200 x 60. In all the company will occupy seven and a half acres of ground there. The general offices, shipping department, storehouse, &c., will remain in Milwaukee and will occupy the new building at Second and Sycamore streets, that city, as soon as it is completed.

The Robinson Machine Works of Belwood, Pa., a plant owned by Philadelphia capitalists, has been sold at receiver's sale to an Altoona syndicate. The works will be enlarged and will give employment to a large force of men in the manufacturing of electric machinery.

The Clinton Wire Cloth Company, at Clinton, Mass., have just completed a new boiler house. The roof is of iron, covered with the Berlin Iron Bridge Company's anti-condensation corrugated iron.

The Bessemer steel department of the National Tube Works Company, McKeesport, Pa., is reported to have turned out recently 782 tons of billets in 24 hours. This plant is equipped with a single 36-inch reversing blooming mill, and the above output is believed to be the largest on record for the above time for any mill so equipped.

## Philadelphia.

Office of *The Iron Age*, 220 South Fourth St.,  
PHILADELPHIA, Pa., December 24, 1894.

The record of 1894 is now about complete so far as regards the Iron and Steel trade, and is by no means a pleasant one to contemplate. The lowest prices ever made were during the first quarter of the year, and although the second and third quarters developed a gradual improvement both in price and demand, the fourth quarter again developed weakness, which is greater to-day than at any time within the past nine months. The volume of business is maintained, however, and in this respect the outlook is not unfavorable, but nothing encouraging can be said in regard to prices. From the increase in the output of Pig Iron, and the decrease in stocks compared with this time a year ago, it might be supposed that business generally has improved in like proportion, say 60 % to 80 %, but this is not borne out by the facts. Machinists, engineers, car and locomotive builders, stove foundries and foundrymen generally find only a very moderate improvement, and the same may be said of the Hardware trade, which is very much depressed. The fact that the Pig metal goes somewhere is proved by the decreased stocks, and as figures are supposed to tell the truth it follows that somewhere in this great country consumption must have increased immensely during the past 12 months. Nevertheless it is a pretty safe estimate to say that in many large manufacturing establishments half time is the rule, although a few report four and some five days a week, but in all cases prices are said to be very unremunerative and, unfortunately, with but little prospect of early improvement. It goes without saying that there is no apprehension of any worse conditions than now prevail, but there is considerable disappointment that the improvement is so slow and that prices seem to be utterly lacking in firmness. The new year will doubtless develop a better state of affairs, but it may require a good deal of preliminary work before prices assume an upward tendency.

**Pig Iron.**—In this department there has been a large business during the past six months, compared with the corresponding period of last year, and on the whole prices have been fairly steady. Compared with a year ago, there has been a decline in price of \$1 @ \$1.50 per ton, all of which was made during the first six months, since which time fluctuations have been very trifling. One reason for this may have been that production at nearby furnaces has not been increased in anything like the proportions shown in other sections, consequently there has been less pressure to sell. Western furnaces crowd in at some points, Virginia at others, and the Alabama furnaces at still other points, but at figures now ruling it is impossible for them to make much headway. The Bessemer trade, however, appears to be pretty well taken up by Pittsburgh, and of late practically nothing has been done on that grade either by the Lehigh or the Schuylkill furnaces. In April sales were made for delivery in this market at as low figures as \$11.50 for Bessemer, but during the Coke strike prices went up to \$14, though there was little or no business done at over \$13, and to-day orders could easily be placed at \$12 @ \$12.25, last sale reported being at the inside figure. In regard to the outlook, the local feeling is inclined toward firmness, but with

continued weakness at other points it will be difficult to do more than hold prices steady. Stocks are light and the demand is good, and if other sections can keep their end up there will be no weakness in Eastern markets. The indications are very favorable for a good demand, deliveries being called for with considerable urgency, and when work starts up after the holidays it is expected that a good deal of buying will be done. At a time like this it is difficult to judge with any degree of certainty what the course of prices will be, but it is the general impression that in three months' time they will show some improvement. Temporarily, dullness and possibly some irregularity may be met with, but when business once gets fairly under way it is believed that prices will gradually work toward higher figures. Meanwhile quotations to-day are about as follows for Philadelphia, and at points within 100 miles South or West about 25¢ @ 40¢ less:

Bessemer.....	\$12.00	@	\$12.25
Standard No. 1 Foundry X.....	12.50	@	13.00
Standard No. 2 Foundry X.....	11.50	@	11.75
No. 2 Plain.....	10.75	@	11.00
No. 1 Soft.....	11.50	@	11.75
No. 2 Soft.....	10.75	@	11.00
Standard Gray Forge.....	10.50	@	10.75
Ordinary.....		@	10.25

**Steel Billets.**—Prices have varied considerably during the past 12 months, not, however, because of legitimate conditions, but because of strikes in various directions, which, by curtailing the supply of fuel, curtailed the supply and enhanced the cost of Steel. The year commenced with prices at \$18.50, gradually declining until about the first week in April, at which time orders were placed at \$17, and in one or two special cases even that low figure was shaded. Toward the latter part of that month quotations were advanced to \$17.50, in May to \$19.50 and in June to \$20.50, asked. During July some little business was done at over \$20, but only small lots were taken to cover pressing requirements. In September prices began to show decided weakness, and although \$19 to \$19.50 was paid for immediate shipments, October deliveries were available at \$18.50 to \$19, and during November from \$18 down to \$17.50, and to this date prices have continued weak, gradually declining to \$17.25, at which figure business has been done during the past few days. Holders are trying to talk firmer prices, but as there is very little disposition to place large orders the immediate outlook is not favorable for a movement of that kind.

**Finished Material.**—The record for the year cannot be regarded as altogether satisfactory, but on the whole there has been a decided improvement over the last half of 1893. Prices have been, and still are, distressingly low, but there is business at a price, which is a great deal more than could have been said a year ago. Compared with 1891 and 1892 we are a long way behind, but mills that were running one-third to one-half their capacity a year ago are now doing from a half to three-fourths, with very encouraging prospects of being able to do still better in the near future. Prices are about \$3 lower than they were a year ago, but with fuller time and cheaper material it is not unlikely that the margin is somewhat better, so that the mill trade, at all events, can see distinctly improved conditions. Competition from the West is exceedingly close, and until mills there begin to look for higher prices it will be useless to attempt it in the East. The lowest figures of the year, and the lowest ever known, were made during

the early portion of March, viz., 1.10¢, delivered, for Refined Bars, 1.15¢ for Plates and 1.20¢ for Angles. From that date to about the 1st of November better prices were maintained; in some cases for quick deliveries the gain was nearly \$5 per ton, but with the decline in Bessemer Pig and Billets a reactionary tendency has been developed in finished material, and on large orders prices are dangerously near to the low figures above mentioned. The feeling in regard to prices is that they are not likely to change much either way. They cannot possibly go much lower, and until more work is distributed it will be equally difficult to secure an advance. Prospects as regards work are believed to be good. January is already pretty well provided for, and if all the work goes through that is being figured on there will be plenty to give full time to all the mills that are now in operation. Some valuable work has been entered within the past three or four days, chiefly bridge and structural work, some for the shipyards and quite a lot of miscellaneous work. Developments during the next 60 days are likely to be very important. If nothing unfavorable occurs it is probable that the volume of business will be established on something approaching the scale of 1890 and 1891, but as a good many projects depend upon contingencies, it is too soon to speak with absolute confidence. Meanwhile, as we said before, prospects are favorable, January is pretty well provided for, later months are being figured on, and, all things considered, with fairly good prospects of materializing satisfactorily. Prices are not noticed as much as they were some time ago. They are very low, almost at the lowest ever known, but adjustments have been made which make them less onerous, and if full time can be made manufacturers will probably be satisfied until conditions warrant an upward movement. General quotations are about as follows for small lots, special quotations being made for large orders:

Grooved Skelp.....	1.20¢	@	1.25¢
Standard Refined Bars.....	1.15¢	@	1.25¢
Medium quality.....	1.05¢	@	1.10¢
Tank Steel.....	1.25¢	@	1.30¢
Heavy Plates.....	1.25¢	@	1.30¢
Shell.....	1.50¢	@	1.60¢
Flange.....	1.60¢	@	1.80¢
Angles.....	1.25¢	@	1.35¢
Beams and Channels.....	1.30¢	@	1.40¢

## Louisville.

LOUISVILLE, KY., December 22, 1894.

For many years, probably, there has not been so much hope and expectancy in the ringing out of the old and ringing in of the new year. This feeling pervades all classes of business, and the Iron, Steel and Hardware trades are susceptible enough to sympathize with the ups and downs of the rest of the world. The kindred Iron trades do not want a boom; that would not be healthy; from the furnaces to the Hardware jobbers, all parties will be satisfied with a good brisk year of business at legitimate prices.

**Pig Iron.**—Dealers and furnace agents all say that nothing is doing, but then begin enumerating small orders, until a fair week's work shows itself in the aggregate. Prices remain firm at the same quotations as last week:

No. 1 Foundry, Southern	
Coke.....	\$9.75 @ \$10.25
No. 2 Foundry, Southern	
Coke.....	9.00 @ 9.50
No. 3 Foundry, Southern	
Coke.....	8.50 @ 9.00



Gray Forge.....	8.25 @	8.75
Mottled.....	8.00 @	8.50
No. 2, Soft.....	8.75 @	9.25
Southern Car Wheel Iron.....	13.00 @	17.00

Very little Old Material is changing hands as Scrap, except a few sales of wheels, but numerous shipments of relay Rails are going into the country, showing a disposition to make betterments in mining and lumber regions, both of which industries will be pushed vigorously during next year. Much higher prices are expected for lumber, especially if a good building year comes on and it is found that all of the better grades of domestic Coal are readily taken by cities north of the Ohio River. The past two summers of drought, so hard on navigation, proved of great advantage to the coal fields of Kentucky. The consumers in this and many other cities now realize, what the geologists have known for years, that Kentucky has deposits of some of the finest coal in the world.

## Pittsburgh.

Office of *The Iron Age*, Hamilton Building, }  
PITTSBURGH, December 24, 1894. }

The week under review did not present a single new feature. No buying is being done, except where the material is needed at once to finish up work already under way. Prices show no material change, there being hardly enough transactions to fix a value on anything.

**Pig Iron.**—Buyers generally are deferring purchases until the new year, and very few sales of Pig Iron are being made and these only for small lots that are needed at once. The way Iron is being piled up at some of the furnaces is creating considerable apprehension, and unless a material increase in sales comes early in the new year it seems certain that the output will have to be restricted. The attempt of the Valley furnaces to come to some agreement looking to restriction of production and fairly profitable prices for their product has not been given up, nor has it been accomplished. One Valley furnace is reported as having contracted for their supply of Ore, Coke and Limestone for next year, and also as having disposed of its entire output for the same period. Both Gray Forge and Foundry Irons are quiet, with prices weak, but unchanged. Several round lots of Foundry Iron for delivery into a considerable part of next year have been sold at very low prices. We repeat quotations of last week as follows:

Neutral Gray Forge.....	\$9.35 @	\$9.50	Cash
All-Ore Mill.....	9.75 @	10.00	"
No. 1 Foundry.....	11.00 @	11.25	"
No. 2 Foundry.....	10.50 @	10.65	"
Bessemer.....	10.15 @	10.25	"

We note a sale of 3000 tons of Bessemer, equal deliveries in January, February and March, at \$9.50 at Valley furnace, equal to \$10.15, Pittsburgh.

**Billets.**—The week has been extremely quiet and few sales have been made. A good many inquiries are in the market, but buyers do not seem anxious to close until after the first of the year. The Steel market may be fairly quoted at \$15 at maker's mill. A few transactions in Rod Billets, with favorable terms of payment, are reported to have slightly shaded this figure. We note two sales of 1000 tons each, equal deliveries in January, February and March, at \$15 at maker's mill.

**Structural Material.**—Only small orders are being placed, the large buyers postponing purchases until after the first of the year. A local bridge concern

have specifications ready for a considerable tonnage that will probably be placed early in January. The new scale for the Homestead plant is ready for the inspection of the employees, and while reductions have been made in nearly all departments it is claimed they are more in the nature of a readjustment, owing to improved methods of manufacture by which a much larger tonnage is secured. This plant is idle now for the usual repairs and inventory, but it is expected to start up early in January. We quote as follows: Beams and Channels up to 15 inch, 1.25¢ @ 1.35¢; Angles and Universal Plates, 1.10¢ @ 1.20¢; Tees, 1.35¢.

**Ferromanganese.**—We quote 80 % domestic at \$48, delivered at buyer's mill, and note a sale of 25 tons at that price.

**Plates.**—The order for Russian Armor Plate, taken by the Bethlehem Iron Company, amounting to 1200 tons, is causing considerable satisfaction here, the local trade regarding it as the entering wedge to a foreign trade that in time is expected to be very large. There is only a moderate demand for Plates, and prices are without change. We quote as follows: Tank Steel, 1.15¢ @ 1.25¢, according to order; Flange, 1.35¢ @ 1.40¢; Shell, 1.30¢ @ 1.35¢.

**Steel Rails.**—A new and somewhat lower wage scale goes into effect at the Edgar Thomson Steel Works on January 1, but will doubtless be accepted by the employees without trouble. There is nothing new to report in Rails.

**Muck Bars.**—We note a sale of 100 tons of standard grade Muck Bars at \$18.50, delivered at buyer's mill.

**Bars.**—Very little new business is being placed, but a number of inquiries are in the market and the outlook for a larger volume of business early in the new year is encouraging. The mills are now undergoing annual stock taking and repairs and the output will be very light for the next couple of weeks. We continue to quote Common Iron Bars at 0.90¢ @ 0.95¢ and Steel Bars at 1¢ @ 1.05¢, with the usual extras.

**Merchant Steel.**—New business is very light, but specifications are coming in for season contracts and the mills are moderately active. We quote as follows: Bessemer Machinery, 1.15¢ @ 1.25¢; Open Hearth Spring, 1.45¢ @ 1.55¢; Open Hearth Machinery, 1.35¢ @ 1.40¢; Machine Straightened Tire, 1.40¢ @ 1.50¢; Sleigh Shoe, 1.50¢ @ 1.60¢; Toe Calk, 1.65¢ @ 1.70¢.

**Sheets.**—There is a fair demand for Black and Galvanized Sheets and a heavier volume of business is looked for after the first of the year. Inquiries are in the market for round lots, but as these largely call for extended delivery there is some hesitation about accepting them, makers preferring not to sell very far ahead at present prices. We quote No. 27 Common Iron, 2.15¢, and No. 27 Steel, 2.25¢. We quote Galvanized Sheets at 80 % @ 80 and 2½ % off, according to order.

**Skelp Iron and Steel.**—We quote as follows: Grooved Steel Skelp, 1¢ @ 1.05¢, according to width and order; Sheared Steel Skelp, 1.10¢ @ 1.15¢; Grooved Iron Skelp, 1.15¢ @ 1.20¢; Sheared Iron Skelp, 1.25¢ @ 1.30¢. These prices are occasionally slightly shaded for large orders with desirable sizes.

**Pipes and Tubes.**—The contract for 25 miles of 6-inch Line Pipe, referred to last week, has not as yet been placed. The report that a change had been made in list and discount Pipes and Tubes

carrying an advance has not been confirmed.

**Wire Rods.**—There is nothing new, and we quote at \$21.50 @ \$22 at maker's mill, the lower quotation being for round lots.

**Barb Wire.**—There is a fair trade, with prices showing a firmer tendency. We quote Four Point Galvanized at \$1.90 in carload lots, for close delivery. For delivery into February and March of next year, an advance of about \$2 per ton over the above price is asked. We quote Plain Wire at \$1.25 in carload lots.

**Wire Nails.**—The volume of business is fairly satisfactory, makers reporting a considerably better demand than during the corresponding month of last year. Prices, too, are reported as showing a firmer tone, and for delivery during February and March higher prices are asked. We quote Wire Nails for January delivery at 90¢ @ 95¢ in carload lots. Cut Nails are in very light demand and are ruling at 80¢ in carload lots for usual averages.

**Iron and Steel Scrap.**—Very little is doing, but dealers look for an improved demand after the first of the year. Prices continue somewhat irregular and are ruling about as follows: No. 1 R. R. Wrought Scrap, \$9.75 @ \$10, net ton; Railroad Cast Scrap, \$9, gross ton; Hammered Iron Car Axles, \$18 @ \$18.50, net ton; Rolled Iron Car Axles, \$15, net ton; Car Wheels, \$9 @ \$10, gross ton, according to quality; Old Iron Rails, \$12, gross ton; Old Steel Rails, 6 feet and over, \$11, gross ton; short or mixed lengths for melting stock are very dull, and are freely offered at \$9, gross ton; Cast Iron Borings, \$5, gross ton; Steel Leaf Springs, \$11.50, gross ton, and Steel Coil Springs \$10.50, gross ton.

**Connellsville Coke.**—For the week ending Saturday, December 15, there were 14,337 ovens in blast in the Connellsville region and 3477 idle, the total estimated production for the week in question being 146,852 tons. Compared with the production of the previous week this shows an increase of 3500 tons in production, and a gain of 125 in active ovens. A number of contracts for Furnace Coke for delivery during the first quarter and in some cases the first half of the year are expected to be closed during this week. We quote Furnace Coke at 90¢ @ \$1, and Foundry Coke at \$1.15 to consumers, all in tons of 2000 pounds, f. o. b. cars in Connellsville region.

## Cincinnati.

(By Telegraph.)

Office of *The Iron Age*, Fifth and Main Sts. }  
CINCINNATI, December 26, 1894. }

The large buyers who entered the market a week or ten days ago have temporarily retired and a record of the local market for Pig Iron during the week under review is devoid of animation or other interesting features. A few orders have reached to the dignity of 500 tons. One single transaction is noted where 1000 tons was sold, but the general run of orders have been small individually and insignificant in the aggregate. Prices are without quotable change, but at the lower level noted last week there seems to be more firmness. Large Southern furnaces are reported to be especially firm, but small stocks are selling at the inside rates, and there is good reason to believe that the market thus established has been met by the larger producers. Still,

at the prices current there is more confidence and a firmer feeling, and while buyers may be holding off until the middle of January; it is known that large contracts will be placed about that time. One point worthy of notice is the long deliveries contracted for, some sales having been made with deliveries extending through eight months of next year. Most of the supplies contracted for do not go beyond six months, and the majority are made for delivery during the first four months of the year. Reports from Pipe works and general foundries continue encouraging; the former especially are running heavy heats. Mills, however, are not conspicuous for activity. The present dullness is not expected to be relieved for several weeks at least, after which time, however, it is anticipated that the placing of orders for considerable iron to cover contracts for railroad equipment and other structural purposes will bring about a period of activity. There has been less movement in Manufactured Iron. Quotations are as follows:

#### Foundry.

Southern Coke, No. 1.....	\$9.75 @	\$10.00
Southern Coke, No. 2.....	9.00 @	9.25
Southern Coke, No. 3.....	8.50 @	8.75
Ohio Soft Stone Coal, No. 1....	14.50 @	15.00
Ohio Soft Stone Coal, No. 2....	14.00 @	14.50
Lake Superior Coke, No. 1.....	11.75 @	12.25
Lake Superior Coke, No. 2.....	10.75 @	11.50
Hanging Rock Charcoal, No. 1....	16.00 @	16.50
Hanging Rock Charcoal, No. 2....	15.50 @	16.00
Tennessee Charcoal, No. 1.....	13.00 @	13.50
Tennessee Charcoal, No. 2.....	12.00 @	12.50
Bessemer.....	11.65 @	12.00

#### Car Wheel and Malleable Irons.

Standard Southern Car Wheel	15.75 @	16.75
Lake Superior Car Wheel and Malleable.....	14.25 @	14.75

#### Forge.

Gray Forge.....	8.25 @	8.50
Mottled Coke.....	8.00 @	8.25

## Chicago.

(By Telegraph.)

Office of *The Iron Age*, 59 Dearborn street, CHICAGO, December 26, 1894.

**Pig Iron.**—The actual business placed during the past week was not large and appears to have been rather evenly divided between Northern and Southern brands. The inquiries for Southern Soft Irons have latterly been increasing and the tonnage in sight is now quite encouraging. The business in prospect for Northern Irons, however, is very heavy for completion after the first of the year. If all the orders now talked of terminate in actual business it will evidently be necessary to increase the number of furnaces in blast in this district. Shipments are so heavy at present that the intervention of the holidays is regarded as an advantage to furnacemen, as many foundries will then be closed down for a few days, which will enable furnace stocks to accumulate a little. It seems rather singular to report such a state of affairs, as it is but a few weeks since considerable anxiety was experienced over the dullness of the foundry trade. Southern furnaces seem to be closely run in the matter of shipments, also, as orders are being received for Northern Iron to take the place of undelivered Southern even at a higher price. The market is very firm on everything except two or three of the less known Southern brands. Quotations are given as follows for cash:

Lake Superior Charcoal....	\$13.00 @	\$14.00
Local Coke Foundry, No. 1....	10.25 @	10.50
Local Coke Foundry, No. 2....	9.75 @	10.00
Local Coke Foundry No. 3....	9.50 @	9.75
Local Scotch.....	10.50 @	11.00
Ohio Strong Softeners No. 1....	12.50 @	13.00
Southern Silvery, No. 1.....	11.50 @	11.75

Southern Silvery, No. 2.....	11.25 @	11.50
Southern Coke, No. 2.....	10.25 @	10.50
Southern Coke, No. 3.....	9.75 @	10.25
Southern, No. 1 Soft.....	10.25 @	10.50
Southern, No. 2 Soft.....	10.00 @	10.25
Alabama Car Wheel.....	17.50 @	18.00
Jackson County Silvery.....	15.50 @	16.00
Other Ohio Silvery.....	14.25 @	14.50
Coke Bessemer.....	11.00 @	11.50
Coke Malleable.....	11.00 @	11.50
Spiegeleisen 20%.....	..... @	26.00

**Bars.**—Inquiries are exceedingly good for January business and prospects are in favor of a larger amount of tonnage then being placed. Actual orders at present are confined to carload lots needed here and there to close out the year. A slight inclination toward lower prices is apparent in some directions, but in the main quotations are continued on mill shipments of Common Iron at 1.05¢ @ 1.10¢, Chicago; Guaranteed Iron, 1.15¢ @ 1.20¢; Soft Steel Bars from strictly Billet stock, 1.20¢ @ 1.25¢. Jobbers' prices for small lots from stock are unchanged at 1.20¢ upward for Iron and 1.30¢ upward for Soft Steel Bars.

**Structural Material.**—Business in this line has been quiet, but the encouraging conditions noted last week for the future still continue. Quotations for mill shipments, Chicago delivery, are as follows: Beams and Channels, 1.45¢ @ 1.50¢; Angles, 1.35¢ @ 1.40¢; Tees, 1.65¢; Universal Plates, 1.35¢ @ 1.40¢. Small lots of Beams and Channels from stock, 1.75¢ @ 1.85¢; Angles, 1.50¢ @ 1.60¢; Tees, 1.70¢ @ 1.80¢.

**Plates.**—The market continues to droop, and lower prices prevail whenever actual business appears in sight, but orders at this time are scarce, and prospects are not bright for the immediate future. We continue quotations on mill shipments, Chicago delivery, as follows: Tank Steel, 1.35¢ @ 1.40¢; Flange Steel, 1.50¢ @ 2¢; Fire Box, 2¢ @ 4.50¢. Store prices are as follows: Iron or Steel Sheets, Nos. 10 to 14, 1.70¢ @ 1.90¢; Tank Steel, 1.50¢ @ 1.65¢; Flange Steel, 2¢ @ 2.15¢; Boiler Tubes, in carloads, weak at 75 % off.

**Sheets.**—The demand for Black Sheets is almost entirely in the nature of contracts for future delivery. Manufacturers appear to be disinclined to make present prices apply to long deliveries, and negotiations are consequently being drawn out. Small sales are being made for early delivery, but the aggregate of such business is not large. Galvanized Sheets are in considerably better demand, and inquiries are coming from a much wider range of trade. Prices are a little firmer and are now quotable at 2.35¢, Chicago, for No. 27 Common, 80 % off for Galvanized, with the usual freight allowance to Chicago, and 10 % off for Copper Sheets. Small lots from stock are continued at 2.40¢ @ 2.50¢ for No. 27 Common, and 75 and 10 % off for Galvanized Sheets.

**Merchant Steel.**—A leading company represented in this market reports having made shipments in November which were in excess of the same month in any year of its history but 1892, and but 10 % below that year. This shows that trade has been satisfactory in the matter of tonnage. December specifications are also coming in at the same rate. New business, however, is quiet. The jobbing trade is good. Mill shipments, Chicago delivery, are quoted as follows: Smooth Finished Machinery Steel, 1.50¢ @ 1.60¢; Smooth Finished Tire, 1.50¢ @ 1.60¢; Open Hearth Spring Steel, 1.60¢ @ 1.70¢; Ordinary Tool Steel, 5¢ @ 7¢; Specials, 10¢ and upward.

**Billets and Wire Rods.**—Contracts for more Billets have been taken for delivery during the first quarter of the year, subject to the ability of makers to furnish them. Manufacturers are resisting the efforts of consumers to make contracts for deliveries extending further into the year. Prices here have not declined in sympathy with those reported in the Eastern markets, but still continue at \$17 for Billets and \$23.50 for Wire Rods. The demand for the latter has recently been very light, as the requirements of the trade are fully covered here.

**Steel Rails.**—Some small contracts have been taken for standard Rails for shipment next year, but business has not been large, nor have inquiries been received from many of the leading lines having headquarters in this locality. Nevertheless the prospects are of such a character that the local mill will probably resume operations very early in January. It is reported that some Canadian business is in sight which may fall into the hands of one of our American mills. Quotations are as follows: Standard Steel Rails, \$23 @ \$25; Steel Splice Bars, 1.30¢ @ 1.35¢; Track Bolts, with Hexagon Nuts, 1.90¢ @ 2¢; Spikes, 1.60¢ @ 1.70¢; Links and P. ns, 1.60¢ @ 1.70¢.

**Old Rails and Car Wheels.**—The trade in this class of material has been practically nothing since last report. Nominal prices are continued at \$10.75 @ \$11 for Old Iron Rails, \$6 @ \$9 for Old Steel Rails, according to length, and \$8.75 @ \$9 for Old Car Wheels.

**Scrap.**—Very little is doing in Scrap Iron with the close of the year so near at hand and manufacturers desiring to keep their yards as clear as possible until after inventory. Dealers' quotations are as follows, per net ton: Railroad Forge, \$8.50 @ \$9; Dealers' Forge, \$8; No. 1 Mill, \$7; Pipes and Flues, \$7; Axles, \$12.50; Heavy Cast, \$7.50 @ \$7.75; Stove Plates, \$5.50 @ \$6; Cast Borings, \$3.25 @ \$3.50; Wrought Turnings, \$5.25; Axle Turnings, \$6.25; Fish Plates, \$9 @ \$9.25; Horseshoes, \$8.25 @ \$8.50; Mixed Steel, gross ton, \$5; Heavy Melting Steel Scrap, \$6.

**Metals.**—Lake Copper is stronger at 10½¢ for carload lots, while standard casting brands are unchanged at 9½¢. Spelter is weak at 3.15¢, with but light demand. Pig Lead has receded and is offered at 2.85¢, at which price refiners would evidently be glad to sell. Prospects are strongly in favor of a heavy trade in metals after the opening up of the new year.

Matthew Addy & Co., 556 The Rookery, Chicago, for whom Andrew Hawthorne is local representative, have been appointed sales agents for Hamilton Coke Pig Iron and Pine Grove Charcoal Pig Iron, both made from the famous Hanging Rock ores.

## St. Louis.

(By Telegraph.)

Office of *The Iron Age*,  
Bank of Commerce Building,  
St. Louis, December 26, 1894.

**Pig Iron.**—The market is practically dead. The holidays are here and consumers are deferring their purchases until the new year. There is no change in prices; the effort which was made to shade No. 2 Foundry below \$7 does not appear to have been successful, and this price is now accepted as bot-

tom. Furnaces have taken the stand that a reduction in prices would not result in any increased business and have wisely refused to shade current quotations. We quote as follows for cash, f.o.b. cars St. Louis :

Southern Coke, No. 1 Foundry	.....	\$10.50 @ \$10.75
Southern Coke, No. 2 Foundry	.....	9.75 @ 10.00
Southern Coke, No. 3 Foundry	.....	9.25 @ 9.50
Southern Car Wheel	.....	16.50 @ 17.00
Gray Forge	.....	9.00 @ 9.25
Ohio Softeners	.....	14.00 @ 14.50

**Bar Iron.**—The demand is extremely light and very few orders are placed for immediate delivery. Inquiries for deliveries extending into next year are more liberal and mills are looking forward to a good trade as soon as the new year opens. The jobbing trade is extremely quiet. Common Iron is quoted at 1.05¢ from mill. Jobbers ask 1.10¢ @ 1.15¢, according to quantity.

**Barb Wire.**—There is no demand to speak of, although inquiries are numerous, and it is to be hoped they will result in some business. Rumors concerning combinations, agreements, &c., are still plentiful. The latest is that English capitalists will shortly control the larger part of the Barb Wire mills of this country. Painted is quoted at \$1.60 @ \$1.65; Galvanized, 40¢ @ hundred weight additional.

**Wire Nails.**—Trade is practically at a standstill in this department; notwithstanding the fact that mills all agree that Nails cannot be sold at a profit at to day's prices, they continue to push sales, and in some cases shade even to day's low prices to catch business. Mills quote \$1 @ keg, f.o.b. cars East St. Louis. Jobbers ask \$1.10 @ \$1.15.

**Rails and Track Supplies.**—A better inquiry is noted for Old Iron Rails. Sellers ask \$10.50, but will doubtless accept less. Steel Rails are quotable at \$24.50 for standard sections. Track Supplies are unchanged, as follows: Splice Bars, 1.15¢ @ 1.20¢; Spikes, 1.60¢ @ 1.65¢; Bolts, Square Nuts, 1.80¢; with Hexagon Nuts, 1.90¢; Steel Links and Pins, 1.50¢; Iron, 1.60¢.

**Pig Lead.**—There is no demand for Pig Lead, and, in the absence of any sales, 2.85¢ is the nominal quotation.

**Spelter.**—There is nothing of interest to note in this department. Sales are few and largely confined to carload lots. Sellers ask 3.10¢.

## Metal Market.

**Pig Tin.**—The suspension of business during the holiday season in London has operated as a check upon speculation in the New York market. This, in turn, has prevented any wide movement in prices, so that upon the whole affairs have presented a rather flat appearance. Deliveries on contracts have been fairly large, but consumers and interior trade have purchased moderately and more or less accumulation of stock in first hands has doubtless taken place. Thus far this month about 1678 tons have been landed here. Prices toward the close of the week under review were about 13.75¢ @ 13.80¢, net cash, for round lots, delivery the next 30 days, with distant deliveries offered at a discount 0.10¢ @ lb.

**Copper.**—Transactions in Ingot have fallen off somewhat latterly, and the buying interest is scarcely as brisk as it was during the early part of the month. Still the demand continues sufficient, along with more or less reserved offer-

ing by producers, to keep prices firm. Current quotations are 10¢ for Lake Superior, 9½¢ @ 9¼¢ for Electrolytic, and 9½¢ @ 9¼¢ for ordinary casting stock.

**Pig Lead.**—Several good sized lots of common Western have been sold at 3.05¢, and it is understood that as low as 3.02½¢ was accepted in at least one instance. The sales, it is understood, were in good part by speculative holders and a few operators who are interested in forcing prices down to facilitate the covering of outstanding short contracts. It has been extremely difficult to buy direct from Western producers at 3.10¢ for early shipment at times when the market here looked weakest, and some authorities state that the stocks in Western producers' hands are comparatively moderate.

**Spelter.**—Hardly any change has taken place in the market during the past week. Dealings have been moderate, all told, and individual transactions involving more than a few carloads were the exception. Western has realized 3.25¢ @ 3.35¢, according to brand and delivery. Those prices prevail at the present time, but anything below 3.25¢ is the exception for other than poorest brands.

**Antimony.**—Jobbing business is fair and prices vary but little, although leaning somewhat in buyers' favor. About 7½¢ @ 7¼¢ is quoted for Hallett's and 8½¢ @ 8¼¢ for Cookson's, as to size of lot.

**Tin Plates.**—The market has been rather dull throughout the week. Orders for future shipments seem to have fallen off considerably and purchases of spot stock have been almost wholly of a strictly hand-to-mouth character. Prices show no radical change, but are rather easy, with the following quoted for spot stock: Charcoal Tins: Melyn Grade, one-half X IC, \$4.75; IX, \$6.25; Lisvane, &c., IC, \$4.30; IX, \$5.12½; Allaway Grade, IC, \$4.20; IX, \$5; Siemens Steel, IC squares, &c., full weight, \$4.30 basis; 100 lb, \$4.00 basis. Bessemer Steel, IC squares, &c., full weight, \$4.25 basis; 100 lb, \$3.95 basis. Coke Tins, IC, 14 x 20: Bessemer Steel, full weight, \$4.00; 100 lb, \$3.65; 95 lb, \$3.57½; 90 lb, \$3.50. Charcoal Ternes: M. F., IC 14 x 20, \$6; IC 20 x 28, \$12; Worcester, IC 14 x 20, \$4.50; IC 20 x 28, \$8.60; Allyn, full weight, IC 14 x 20, \$4; IC 20 x 28, \$8; Allyn, 100 lb, IC 14 x 20, \$3.85; IC 20 x 28, \$7.60; Dean, full weight, IC 14 x 20, \$4.05; IC 20 x 28, \$8.10; 100 lb, IC 14 x 20, \$3.90; IC 20 x 28, \$7.80; D. R. D. Grade, full weight, IC 14 x 20, \$3.90; IC 20 x 28, \$7.85; 100 lb, IC 14 x 20, \$3.80.

## Financial.

The occurrence of the Christmas holidays has, as usual, brought about a condition of semi-stagnation in the financial world. The market for stocks and bonds has been extremely dull, with trading at a minimum, while the loan market has been heavier and quieter than ever. The only noteworthy circumstance during the week under consideration has been a further shipment abroad of over \$2,000,000 in gold, and continued shrinkage in the Treasury reserve of the metal. On Tuesday the Government held about \$89,000,000 of the metal. Very nearly one-half of the gold received for the recently issued bonds has thus been already drawn out of the Treasury; and the prospects favor a further heavy withdrawal before the close of the present week.

Little change has developed in the general trade situation. While in some lines an increase is noted in the volume of orders for future deliveries, prices show no improvement, and in many respects the regular holiday trade has been poor. Yet there are indications of a reviving confidence in the future of business after the turn of the year, provided uncertainty as to currency legislation does not exert too potent an influence in the opposite direction. The volume of domestic trade, according to the returns of bank clearings for last week, shows little or no gain, except as compared with last year, which was an unusually dull one at this season. Exchanges for the week were 7.9 % larger than in the corresponding week of 1893, but 33.1 % smaller than those of 1892.

The *Financial Chronicle's* compilations show that for the first week of December 78 railroads exhibited a gain of 2.47 % in gross earnings, but 54 roads reporting for the second week show an increase in gross earnings of only 0.12 %. Nevertheless, the impression appears to prevail that earnings will be heavier after the opening of the new year. The bill to permit railways to pool will, it is believed, have a beneficial influence on future earnings. The volume of railroad traffic west from the seaboard shows an increase over that of last year, but east bound tonnage from Chicago is reported as considerably short of last year's figures.

Money continues to flow to this center from the interior, indicating a continuance of slackness in the demand for funds. Saturday's weekly statement of the Associated Banks of this city was regarded as unfavorable, as it showed not only a contraction in loans, but also an accumulation of specie at the expense of the Treasury. The surplus reserve increased \$554,850, and now stands at \$33,900,000. Loans decreased \$8,600,000, and legal tenders decreased to almost precisely similar extent, while specie increased \$6,550,000. Deposits decreased \$10,300,000 and circulation increased \$36,200. The heavy decrease in loans is attributed mainly to liquidation of sums borrowed to pay for Government bonds.

A change has come over the face of the loan market in that the borrower instead of the lender is now the seeker. As the amount of loanable capital has become more contracted since the purchase of the new Government bonds, so, although the demand from borrowers has not expanded to any notable extent, the banks are able to maintain a firmer attitude, and show less disposition to jump at all offers. The call loan market is decidedly stronger than it has been for the past 12 months. The 1 % rate, which has been the ruling one for so long, is no longer quoted, and banks and trust companies have marked up their figures to 1½ % or 2 %, endeavoring in most cases to obtain the last mentioned figure. First-class collateral is also required. Time loans are usually made at the full rates. Lenders are asking and obtaining 2 % for 30 days; 2½ % @ 3 % for 60 days to four months; 3½ % @ 4 % for longer periods. The supply of time money is still ample. Commercial paper of high grade is somewhat scarce and the demand continues good, some of the banks accepting slightly lower rates than those quoted; in cases of exceptionally good paper, rates are 2½ % @ 3 % for 60 to 90 day indorsed bills receivable; 3 % @ 3½ % for four months' commission house and prime four months' single names; 3½ %

@ 4 % for prime six months and 4½ %  
@ 7 % for good four to six months' single names.

Business on the Stock Exchange has been narrow and entirely professional, with no developments worth special mention. The undertone is, however, strong and hopeful. Prices show no radical change, although some foreign selling late last week brought about a temporary weakness, which was recovered from on Monday.

The demand for railroad and miscellaneous bonds has been quiet and prices softer. Government bonds have been heavy under the prospect of a further issue. Round lots of the new 5's have been offered as low as 118, although the agents of the syndicate which took the issue still ask 119½. The closing quotation on the Stock Exchange was 117½ @ 118½.

Sterling exchange has been quiet and fairly steady, while receipts of bills have been light, as is usual at the holiday season. The shipment of \$2,100,000 to France on Saturday was due to an advance in the price paid for gold by the Bank of France.

The annual statements of the Vanderbilt roads, exclusive of New York Central, and the dividends declared caused little or no activity in those stocks. Lake Shore declared its regular semi-annual dividend of 3%. The dividends of Michigan Central and Canada Southern were reduced 1½ % and 1 % respectively. The gross earnings of Lake Shore for the year were shown to have decreased over \$4,000,000, or more than 17 %, but operating expenses were cut down nearly as much, leaving a slight surplus after the payment of the dividend. Michigan Central and Canada Southern together show a decrease of nearly \$3,500,000, or nearly 21 %, but their expenses were contracted to such an extent as to leave a net shrinkage of only \$363,238. On the first named 2 % dividend was declared and ½ % on the second.

## New York.

Office of The Iron Age, 96-102 Reade street, New York, December 26, 1894.

**Pig Iron.**—The market is very dull, the demand being light. There is, on the other hand, no exceptional pressure to sell. Lately brokers have made a number of inquiries concerning prices for American Pig Iron for export, but as yet nothing seems to have come of it. We quote \$12 @ \$12.50 for No. 1; \$11 @ \$12 for No. 2, and \$10.50 @ \$11 for No. 2 Plain, standard brands, tidewater delivery. Southern Iron, same delivery, is selling at \$11.25 @ \$11.50 for No. 1; \$10.25 @ \$11 for No. 2; \$10 @ \$10.50 for No. 3; \$10.25 @ \$10.75 for No. 2 Soft, and \$10.50 @ \$10.75 for No. 1 Soft. Foundry No. 4 (Foundry Forge) is \$9.50 @ \$10.

**Cast Iron Pipe.**—It is still uncertain whether the Japanese order for 10,000 tons of Cast Iron Pipe will come to this country. Figuring is still going on. We understand that the Scotch makers have obtained a considerable reduction in freights, 20 shillings being now named, as against 30 shillings some time since. The last rate named from Pensacola was \$5.53. Efforts are now being made to lower that figure.

**Ferromanganese and Spiegeleisen.**—In the absence of business we quote nominally \$46.50 @ \$48 for 80 % Ferromanganese and \$20 @ \$20.50 for 20 % Spiegeleisen, tidewater.

**Billets and Rods.**—Reports are current that the equivalent of \$15, Pitts-

burgh, has been shaded. Wire Rods are also weaker, \$21.50 in the West being an open question. We quote nominally \$17.50 @ \$18 for domestic Billets and \$24 @ \$24.50 for Wire Rods, tidewater.

**Steel Rails.**—No sales are reported by Eastern mills, and there is evidence that the Western works, too, are doing very little. The price seems to have very little to do with the matter, particularly since the makers are generally willing to protect the buyer against a decline. The fact of the matter is that the railroads themselves do not know what part of their requirements they can afford to give out. They are too uncertain as to their own future to give out positive orders. The outlook is not regarded as very rosy for the Eastern mills, because a considerable number of the large systems bought heavily during the break of November, 1893. If next year is to bring any notable increase in tonnage over 1894, it will have to come from the West, South and Southwest, and will favor the Western works. It should not need much to pass the record of the wretched year now closing. Up to December 1, the total shipments of the Rail mills figured up to 636,000 tons. Counting in the Colorado mill, this means considerably less than 700,000 tons of standard Rails for the whole year, and that includes a respectable quantity of heavy standard Rails for the electric roads, with new mileage of less than 2000 miles, requiring less than 200,000 tons of Rails for new lines. This means that the renewals for the enormous mileage of this country were less than 500,000 tons, which is about one-half of what, according to the usual estimates, are the normal requirements. It is a poor satisfaction to know that this means a tremendous piling up of the demand for some future time. We continue to quote \$22.75, tidewater, for standard Rails and \$24 for Girder Rails.

**Track Material.**—We quote as follows: Spikes, 1.40¢ @ 1.60¢; Fish Plates, 1.20¢ @ 1.40¢; Track Bolts, Square Nuts, 1.80¢ @ 1.90¢, and Hexagon Nuts, 1.90¢ @ 2¢, delivered.

**Manufactured Iron and Steel.**—No important contracts for Structural Material have been given out in this city this week. The outlook is fair. There are about 20 steel structures, large and small, under consideration for this city, and some pretty good work is coming out in Boston. Some of the Eastern Pennsylvania Plate mills have taken some good orders, including two of 700 tons each, and some pretty fair quantities of Bridge work has been placed. The contract for the Blackwell's Island bridge has not yet been awarded. The Eastern Bar makers had a conference in Philadelphia last week and will meet again on the 3d prox. We quote: Beams up to 15-inch, 1.30¢ @ 1.50¢ for round lots; Angles, 1.20¢ @ 1.35¢; Universal Mill Plates, 1.20¢ @ 1.35¢; Tees, 1.40¢ @ 1.60¢; Channels, 1.35¢ @ 1.60¢, on dock. Steel Plates are 1.25¢ @ 1.40¢ for Tank: 1.40¢ @ 1.45¢ for Shell; 1.50¢ @ 1.55¢ for Marine; 1.50¢ @ 1.65¢ for Flange, and 1.75¢ @ 2¢ for Fire Box, and 2¢ @ 2.25¢ for Locomotive Fire Box, on dock; Refined Bars are 1.10¢ @ 1.9¢, on dock, and Common 1.05¢ @ 1.10¢; Soft Steel Bars are 1.10¢ @ 1.30¢; Scrap Axles are quotable at 1.25¢ @ 1.50¢, delivered; Steel Axles, 1.25¢ @ 1.50¢, and Links and Pins, 1.35¢ @ 1.50¢; Steel Hoops, 1.40¢ @ 1.50¢; Best Iron Boiler Rivets, 2.90¢ @ 3¢, delivered; Machinery

Steel, 1.20¢ @ 1.40¢; Toe Calk, 1.60¢ @ 1.70¢, and Sleigh Shoe, 1.20¢ @ 1.25¢; Tire, 1.30¢ @ 1.35¢, and Spring, 1.65¢ @ 1.70¢, delivered.

## British Metal Market.

[Special Cable Dispatch to The Iron Age.]

LONDON, December 26, 1894.

Pig Tin prices improved early in the week to £62.15/ for prompts on lighter offerings and better demand, together with what appeared to be some syndicate support, but subsequently eased off somewhat. There has been a large demand for three months' forwards at 2/6 over prompts. The suspension of operations on the Exchange during the last half of the week leaves the market in an uncertain condition at the moment. Last official quotations (Friday) were £62.17/6 for prompts and £62.17/6 for three months' futures.

Copper has been firmer on better American advices, good demand for English refined and rumors of inquiries for the latter for shipment to the United States. Good merchant bars have been less freely offered. The last official quotations were £41. 2/6 for prompts and £41. 10/ for three months' futures. Best selected English remains at about £43. 10/.

Tin Plate business has been extremely limited and the demand is disappointing. Dullness is partly due to holidays. Wasters, being in fair demand, are exceptionally steady as to price. The quotations, f.o.b. Swansea, are as follows:

Bessemer Cokes, IC 14 x 20 .....	9/6 @ 9/9
Siemens Cokes, IC 14 x 20 .....	9/9 @ 10/
J. B. Steel Cokes, IC 14 x 20 .....	9/9 @ 10/
Ternes, 20 x 28 .....	18/6 @ 21/
Charcoals, IC 14 x 20 .....	10/6 @ 12/6

Pig Lead has been slow of sale and the market at present is rather weak, with £9. 10/ about the best price for Soft Spanish.

Spelter has undergone hardly any change in price, but the market shows rather weak tone, with sellers at £14.-10/ for ordinary Silesian.

The Iron and Steel trades have been exceedingly slow. Operations in Pig Iron warrants have also been on a very small scale. Last quotations on warrants were at 42/ for Scotch, 35/ for Cleveland and 43/ @ 43/3 for Hematite.

Rumors have been afloat that the Carnegie Steel Company were to buy out the Johnson Company, but were given little credence. Dispatches now announce, on the authority of Max Suppes, general manager of the Johnson Company, that an agreement has been closed between that company and the Carnegie Steel Company by which the latter acquires a large tract on Black River, Lorain, opposite the Johnson plant, on which a large steel plant will be erected. Pittsburgh will eagerly seek for an explanation of this move, since it appears to justify the claim that steel can be made considerably cheaper on the Lakes than in the Smoky City.

The *Railway Age* estimates railroad mileage constructed in 1894 at 1949 miles, the lightest in 20 years.



# HARDWARE.

## Condition of Trade.

**H**OLIDAY FESTIVITIES and the usual routine of the closing days of the year have interfered largely with the volume of business. Merchants are naturally deferring as far as possible the placing of orders for goods, and their purchases are accordingly limited to their actual necessities. The market is unchanged in its tone in the matter of prices, the weakness which has prevailed and the tendency to lower values still continuing, being felt in some lines which have not heretofore been much affected. With the decline in the price of goods which has taken place during the year, in making the annual inventory, it will be with many merchants necessary to enter at less than cost many goods which have been carried for any considerable time, and this shrinkage in values will, unless the business has been characterized by close and judicious buying, be no inconsiderable factor in reducing the profits of the year. It is, however, a matter of congratulation that the Hardware trade has endured so well the long continued depression, and the new year will be entered upon in a more hopeful spirit, and with the expectation of a gradual if not rapid return to normal business conditions.

### Chicago

The Hardware jobbing trade has fallen off to some extent with the approach of the holidays, but is by no means as dull as had been expected. Orders continue to be received for all kinds of goods, showing that retailers are obliged to keep replenishing their stocks. Inventory taking this year will be pursued under difficulties, as the attention of clerks cannot be given unreservedly to that absorbing occupation. Traveling salesmen are now in, for the purpose of making their annual arrangements and receiving instructions upon the points to be specially observed in the campaign of 1895. A novel feeling is observed among them. Usually they are in no hurry to get out on the road, but this year they are impatient to visit their trade. This is due to the promises given them of orders to be placed after January 1. If the orders then secured shall realize expectations, the New Year will start off with a heavy volume of business. Staple goods ap-

pear to be principally covered by the promises which are referred to. As they always carry with them more or less Hardware, the outlook is regarded as exceptionally favorable; very much better than that of last year at this time.

### St. Louis.

The demand for Hardware is necessarily limited. Traveling men are all in, making arrangements for next year, and the mail order trade at this time is never very heavy. In less than a week the year 1894 will be a thing of the past, and jobbers and manufacturers alike will welcome the new year, with the hope that it will be an improvement over the year just closing. The past three months of this year have been entirely satisfactory so far as volume of business is concerned, but the steady falling of prices has been disheartening. It now looks as if the bottom had been reached, and efforts will, no doubt, be made to advance prices just as soon as the spring trade opens. Staples, like Barb Wire and Wire Nails, have steadily dropped since the year opened, and with Wire Nails at \$1 per keg and Painted Barb Wire at \$1.60, it certainly seems impossible that they can go any lower. Collections are very good.

## Notes on Prices.

**Wire Nails.**—The past week has been characterized by a continued inquiry for Wire Nails, which is good, considering the season. The mills also report a fair volume of business. In the matter of prices there is little change, Nails being held at 85 to 90 cents on carload lots at mill, but the former figure is not given as freely as a week or two ago, and on the whole the market is steady and inclines to firmness. Small lots from store in New York are held at \$1.15 to \$1.20. Reports indicate that stocks in dealers' hands throughout the country are almost uniformly light, and the mills have not yet begun to accumulate Nails to any great extent.

**Chicago.**—Manufacturers report an increasing business, which is chiefly among outlying districts. The city trade appears to be well supplied. Factory prices are continued at about \$1, Chicago. Jobbers report a much better inquiry from their customers and look forward to a large carload trade in January. Quotations are continued at \$1.10 for small lots from stock, \$1.05 for small lots from factory and \$1 for carloads shipped direct from factory.

**Cut Nails.**—The Cut Nail market is quiet, transactions being limited to the immediate requirements of the trade. Its tone is unchanged. Quotations are based on 75 to 80 cents at mill in carload lots of 60-cent average, but are often made at higher figures which cover delivery at the principal points. Carload lots on dock, New York, are held at 85 to 90 cents, and small lots from store at 90 to 95 cents.

**Chicago.**—The local factory is now closed for repairs, but will be again in operation early in January, as orders are being received which will compel the resumption of work. The past week has been more fruitful in this respect than any for a considerable time. Some of the orders thus booked are of the old-time magnitude. Prices are continued at 95 cents to \$1, Chicago, for factory lots of 55-cent average. Small lots from stock stand at \$1.

**Barb Wire.**—The demand for Barb Wire is moderate, many orders having been already placed, and some houses being disposed to wait until the new year opens in order to observe the course of the market. There are some who think that possibly orders may be placed at lower figures than those now current, but many well-informed houses recognize the importance of having orders booked in good season so as to assure delivery of Wire in time to meet the demands of business. Prices are, as they have been for several weeks, on a basis of \$1.85 to \$1.90 for Four-Point Galvanized in carload lots at mill, but on large orders concessions are obtainable.

**Chicago.**—Manufacturers report a light business, as their salesmen are now at home for the holidays and orders are not coming in unsolicited. Jobbers have also done very little of late, but expect to do well after January 1, if inquiries now received develop into actual orders, as they have every reason to expect. Quotations are continued of \$2 10 for small lots of Galvanized and \$1.75 for Painted from stock, \$2.05 for Galvanized and \$1.70 for Painted from factory, and \$2 for carloads of Galvanized and \$1.65 for Painted with direct shipment from factory. In connection with the rumor now in circulation regarding the probability of reviving the recent attempt to form a Barb Wire organization, it may be of interest to the trade to give a hitherto unpublished reason for the sudden termination of what at the time seemed to be a most successful plan of operation. It is said that one of the largest companies,



and, therefore, most deeply interested in the maintenance of prices, insisted upon concessions which were wholly disproportionate to its past business. The majority of manufacturers were so desirous of turning the unprofitable condition of the trade into one which would give them at least a slight return on their investment, that they were willing to concede what was asked for the sake of harmony, but a few could not bring themselves into a frame of mind to submit to what they deemed an unjust demand. Their consent to the plan being withheld or withdrawn, the scheme fell to the ground. Its failure is deplored by all who have knowledge of the basis upon which it was founded,

facturers and those outside. Randolph & Clowes, Waterbury, Conn., in sending out the new lists, give prices also on extra sizes of Seamless Brass and Copper Tubes, of which they are the only manufacturers in this country, as follows:

#### Brass Tubing.

To Inside Diameters only:													
O. G.	N. G.	8	9	10	12	13	14	16	18	19	20	21	22
8	6	36	44	44	49	49	49	49	49	49	49	49	49
9	7	36	44	44	49	49	49	49	49	49	49	49	49
10	8	36	44	44	49	49	49	49	49	49	49	49	49
11	9	36	44	44	49	49	49	49	49	49	49	49	49
12	10	37	45	45	50	50	50	50	50	50	50	50	50
13	11	38	46	46	51	51	51	51	51	51	51	51	51
14	12	39	47	47	52	52	52	52	52	52	52	52	52
15	13	40	48	48	53	53	53	53	53	53	53	53	53
16	14	42	50	50	53	53	53	53	53	53	53	53	53
17	15	44	52	52	53	53	53	53	53	53	53	53	53
18	16	46	54	54	54	54	54	54	54	54	54	54	54
19	17	48	55	55	55	55	55	55	55	55	55	55	55
20	18-19	50	57	57	57	57	57	57	57	57	57	57	57

which have been taken by manufacturers at the low prices which have been ruling are of such volume that factories will be quite busily employed in filling them for the coming two months. The low prices at which jobbers have placed orders for large quantities of Glass may give them control of spring prices, as present demand is limited. Manufacturers will produce stock for themselves after these orders are filled, so that in all probability there will be no scarcity of Glass in the spring. The meeting called by the Indiana Glass manufacturers to consider a revision of prices, to which reference was made in our issue of the 13th inst., was adjourned to meet soon after the first of the year.

### Seamless Brass Tubes.

December 7, 1894.

Outside Diameter.—Stub's Wire Gauge Standard.

Cents per pound.

Stub's W.G.	B.&S. W.G.	1/4	5/16	3/8	7/16	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4	1 1/2	1 3/4	2	2 1/4	2 1/2	2 3/4	3	3 1/4	3 1/2	3 3/4	4	4 1/4	4 1/2	4 3/4	5	5 1/4	5 1/2	5 3/4	6	6 1/4	6 1/2	6 3/4	7	7 1/4	7 1/2	7 3/4											
8	8	...	...	...	...	...	...	...	...	21	20	18	17	16	15	15	15	15	15	15	15	15	16	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30											
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18	18	...	...	...	...	...	...	...	...	31	30	29	28	27	26	25	24	23	22	21	20	18	17	16	15	15	16	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30							
19	19	...	...	...	...	...	...	...	...	32	31	30	29	28	27	26	25	24	23	22	21	20	18	17	16	15	15	16	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30						
20	20	...	...	...	...	...	...	...	...	33	32	31	30	29	28	27	26	25	24	23	22	21	20	18	17	16	15	15	16	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30					
21	21	...	...	...	...	...	...	...	...	34	33	32	31	30	29	28	27	26	25	24	23	22	21	20	18	17	16	15	15	16	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30				
22	22	...	...	...	...	...	...	...	...	35	34	33	32	31	30	29	28	27	26	25	24	23	22	21	20	18	17	16	15	15	16	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30			
23	23	...	...	...	...	...	...	...	...	36	35	34	33	32	31	30	29	28	27	26	25	24	23	22	21	20	18	17	16	15	15	16	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30		
24	24	...	...	...	...	...	...	...	...	37	36	35	34	33	32	31	30	29	28	27	26	25	24	23	22	21	20	18	17	16	15	15	16	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
25	25	...	...	...	...	...	...	...	...	38	37	36	35	34	33	32	31	30	29	28	27	26	25	24	23	22	21	20	18	17	16	15	15	16	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30

NOTE.—For diameters of the fractional parts of an inch, where no price is given, take the column to the left of where such size would appear if designated, thus: 1 15-16 would go at price of 1 1/4 inches, 1 1/4 at the price of 1 1/2 inches, 5 1/4 inches at the price of 5 inches. No. 20, S. G., 1 inch is 27 cents; No. 20, S. G., 1 1/4 inches is 25 cents; No. 20, S. G., 1 1/2 inches would be 27 cents, and not 25 cents.

Copper Tubes, 3 cents per pound additional.

#### Prices—Iron Pipe Sizes.—Brass.

1/8	1/4	3/8	1/2	5/8	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5	6
26	24	21	19	13	13	13	13	13	13	13	15	15	17	19	23

For all Tubes 1/4 inch thick or thicker (with the exception of Standard Iron Pipe sizes) we shall charge 5 cents per pound more than above price-list.

#### Tubes Cut to Lengths.

Tubes cut from 1 to 2 feet, inclusive, 2 cents extra advance on list.	Tubes cut from 2 to 4 feet, inclusive, 3 cents extra advance on list.
9 inch and up to 12 inch, 3 cents extra advance on list.	9 " 4 " "
4 " 6 " "	6 " 5 " "
2 " 4 " "	4 " 6 " "
1 " 2 " "	2 " 7 " "
3/4 " 1 " "	1 " 8 " "

Brass Condenser Tubes, 5/8 to 1 inch, inclusive, 19 cents per pound, to No. 18, S. W. G.; 2 cents per pound extra for each W. G. number thinner. No charge for tinning. Tinning Tubes other than Condenser Tubes, 3 cents per pound extra.

as it would probably have insured beneficial results to the entire trade.

**Hoop Lock Cutter.**—A description of Penney's Monitor Improved Hoop Lock Cutter was given in *The Iron Age* December 6, as put on the market by W. K. Morison & Co., Minneapolis, Minn. The Cutter is sold to the trade at \$5.50, f.o.b. Minneapolis, 60 days, less 2 per cent. discount for cash in 10 days.

**Brass and Copper Tubes.**—The manufacturers of Seamless Brass and Copper Tubes have issued under date December 7 revised prices on these goods. The new lists are given herewith. It will be observed that a reduction of 2 cents per pound is made on Brass and Copper Tubes, and on the Iron Pipe sizes of Brass Tubes a reduction of 3 cents per pound. The prices given in the lists are net cash 30 days without discount. The lists herewith given have been adopted both by the associated manu-

**Post Boring Machine.**—The Post Boring Machine illustrated in our issue 13th inst., and manufactured by Fox Machine Company, Grand Rapids, Mich., is sold to the trade at \$30 net.

**B. B. Caps.**—A reduction of 10 per cent. has been made by the manufacturers in the price of B. B. Caps.

**Heater and Illuminator.**—In our last issue we gave an illustrated description of the Domestic Gas Light Heater and Illuminator, put on the market by the Hamsley Metal Roofing Company, 18 Cliff street, New York. This article is sold to the trade at \$4.50, subject to a discount of 40 per cent.

**Glass.**—The Glass market is characterized by the quietness which is expected to pervade trade during the holiday season. Little Glass is changing hands, and such orders as are received by jobbers are for small quantities. It is reported that the orders

No reliable quotations are available, and both prices and trade are unsatisfactory.

### Dinners.

**ARRANGEMENTS** for the Hardware dinner, January 31, are progressing satisfactorily. The trade, however, will learn with regret that it is not deemed feasible to give this dinner in the rooms of the Hardware Club, as it would be difficult to accommodate there the number of persons who would desire to attend without interfering more or less seriously with the regular service of the club. The dinner will, therefore, be served at Sherry's.

THE MEMBERS of the firm of Sickels, Sweet & Lyon of New York City will give a dinner to their employees on Thursday evening, December 27, at the rooms of the Hardware Club.

This dinner is an annual custom with the house, and has invariably proved an occasion of the most enjoyable character.

THE second annual dinner tendered by the Beck & Gregg Hardware Company, Atlanta, Ga., to their employees was given at the Hotel Aragon, in that city, on Saturday evening, December 22.

## Growth of the Cycle Business.

BY EDWARD D. WARNER.

NO TREE in the forest of commercial enterprise has taken root more deeply than has the Bicycle business, which a few years ago was as an infant cooing for public favor, but now is in the vigor and strength of youth.

### Evolution of the Wheel.

Beginning with the Velocipede, following with the high ordinary, and then back again to a likeness of its first form, but evolved into the wonderful machine of to-day, the Bicycle, from being a luxury for the few, is fast becoming a necessity to the well being of the multitude. The demand, even in this age of commercial surprises, is extraordinary—so great, indeed, as to make the supply of large factories inadequate. Each succeeding year, each month almost, has produced some new concern, until now we find in the market a profusion of wheels and a constantly increasing demand.

### Early Distributors.

At first the manufacturers sought an outlet, not through the natural and conservative channel, the Hardware trade, but by every crevice through which they could force their product. Thus, in the early history of the trade we find the Bicycle business conducted through the medium of special agents housed in drug store or shop, with office upon the curbstone. Many racing men were also employed as agents. The Bicycle agent was met everywhere. Go for a prescription and he offered you a wheel; go for a hat and he expatiated upon the beauties of a Safety; but go to the Hardware merchant for a machine and one was met with—"they are not in our line."

### Cause of the Change.

On the one hand, many irresponsible agents and the fact that the Hardware trade was the natural outlet; on the other, the fact that greater net profit would accrue to the average dealer from the sale of a single wheel than from a month's sales of either wire or nails, has tended to bring the Cycle into the Hardware store. Since supply has begun to force demand, resulting in competition, the manufacturer sees that now a Bicycle sells, not because it is a Bicycle, but through steady business push and patience, supplemented by effective display, persistent advertising, and thorough understanding of the merits of a wheel by a responsible agent in whose representations the people have faith.

Such an agent is the retail Hardware dealer, and consequently the Hardware store is the natural and most advantageous outlet for the manufacturer. The dealer, from the great and ever increasing demand and the direct profit accruing from the sale of wheels and sundries, is finding the Bicycle line a very desirable one.

### The Business Enlarging.

But granting such to be the case, is it practicable for a Hardwareman to take up a new line, of which he knows almost nothing, and attempt to divert business, long established in the hands of experienced agents, to himself? It would have been more difficult several years ago than now to build up a trade, for then, as a new thing, the makers were attempting to secure for their wheels a name and to build up a trade through the racing men. It resulted in racing men being the first agents; but gradually the circle widened, a quick demand sprang up, money was seen to be in the business, and agencies were established with the first applicant if he was at all responsible.

Often a wheel was taken more to obtain one for personal use than to push it; this, coupled with the irresponsibility and lack of permanency of many of the agents, impressed jobber and manufacturer with the fact that the Hardwareman would make the best retail distributor for the product. With the popularizing of the Bicycle, its increased use by women as well as men, and the assured permanency of the business, special Bicycle stores were opened, carrying complete assortments of wheels and sundries. They doubtless are a fixture in the business, especially in the large cities, and their competition is most keen; but the Hardwareman is well able to cope with them because of the less attendant expense.

### A Settled Policy.

The practicability of the retail Hardware merchant selling wheels is assured, for nearly everything is in his favor, whether considered from the standpoint of profit or the upbuilding of trade, due to the pushing of a successful specialty. Bicycles have come to stay. They are every year becoming more popular and general in their use. The Hardwareman who realizes this and identifies himself progressively with the business will reap his reward in larger sales and increased profits. One has but to look at the success of certain Hardware jobbers who earlier realized the desirability and practicability of Bicycles in the Hardware trade, to be convinced not only that this is where they belong but that he should be one of those to be benefited by their introduction and sale.

### Difficulties Overcome.

To be sure, the difficulties of inaugurating and building up a successful Bicycle business are many. Trade must be diverted, and new custom made. Competition is keen; failures and discouragements abound. The

petty annoyance resulting from abused wheels returned as defective, and similar experiences in other ways, harass the dealer. But the appearance is worse than the reality. The courteous manner, the cheery welcome, the pleasant smile, and the effort to please that must accompany any successful retail business, if found here, will not alone win custom and build up trade, but will transform the seeming mountains into mists. Honest competition, limited, is the life of trade, as it brings into play one's best ability and activity. The Bicycle business can best be built up by handling a good, reliable wheel, displaying and advertising it well, and in every way striving to please.

The difficulties of starting and conducting a Bicycle business in connection with Hardware are largely imaginary. For example, one of the first questions that confronts one is: How shall I best conduct it, being unacquainted with the business? There can be but one answer: Learn it, or make it a department in the hands of a capable man, who also should learn it. As a department with a capable head the line will not conflict with the general trade. This is but one of the problems that must confront any man in starting a new business or entering a new field. But push, perseverance, patience and pluck, backed by courtesy, will bring success to any business, let alone the grafting of a Bicycle business into that of Hardware.

### Selecting a Line.

The assortment which the Hardwareman can best carry depends largely upon circumstances and the trade to which he caters. In a city it should be more varied and complete than required in a town, varying also according to the kind of competition. In any case it should follow the line of greatest demand and least supply. For a good city demand the assortment should include high grade wheels, up to date, as there is a class who will have nothing but the latest and best. Then there must be "scorchers" for the racing man. Ladies' wheels are important, as ladies are beginning to appreciate to the full the advantages of cycling. Lastly, the increasing demand for children's wheels must be provided for. In general, the country over, the assortment should comprise a high grade and a medium grade wheel, a ladies' wheel and a boy's machine. In either case, with the present facilities of transportation, it is more profitable to have stock well assorted, but for immediate wants only. Less capital is required, and the liability of carrying wheels over is reduced to a minimum. One wheel carried over will destroy the profit on several.

The best results are obtained from confining oneself as far as possible to one line of wheels. Attentive concentration upon a single line, either of policy or of procedure, begets knowledge and power. Knowing one line of wheels thoroughly, the dealer is better able to impress upon the prospective

customer the merits of his wheel than if his attention were given to a number of machines. The buyer wants one wheel, not several; if he is distracted and confused by the merits of the many, will he buy one? He naturally will go elsewhere.

#### Bicycle Accessories.

Bicycles can be sold to good advantage alone, but a well-assorted line of sundries, consisting in general of articles in greatest demand, such as Lamps, Bells, Locks, Cement, Oil, Tools, &c., can be handled with profit. It constitutes a desirable aid, as it helps to attract and crystallize the trade.

#### Repair Shop.

A repair shop is a great aid. It is beneficial in concentrating Bicycle thought about the dealer as well as being exceedingly profitable during the Bicycle season. If there be business in wheel repairs the year round, it might pay to have a competent man in charge of a permanent repair shop. This, however, would be desirable only in extreme cases. Often, arrangements can be made with some neighboring machinists upon commission, or, better still, if one has the place, some back room can be rented to a good repairer upon commission. Oftener the simpler repairing can be done by one of the clerks or the tinner, with a little instruction. But some sort of a repair shop, while not necessary, is desirable, as it binds merchant and trade more closely together. Also old wheels taken in part exchange can be fixed up and rented. Renting Bicycles helps business and is very profitable.

#### Cash or Installments.

In selling, the majority of wheels are sold upon contracts, part down, the balance payable in installments by the week or month, terminating within a greater or less period of time—usually greater. Comparatively few are sold for cash, yet there is where the greatest profit is made. Should a Hardwareman sell a bill of goods of equal amount at same per cent. of profit for an equal length of time, payment in installments, he would think himself, and rightly so, upon the road to bankruptcy. As in general business, so is it with Bicycles, money is best made, not in large direct profit, but in selling for cash, even upon close margins, and continually reinvesting. A competitor may have a large stock and may sell more wheels, but with a small but carefully selected assortment, tastefully arranged and vigorously pushed, the chances are largely in favor of the smaller stock, and a greater real profit than the competitor. Moreover, care and annoyances that seem inseparable from a credit business will be spared you. Ground may not be covered so fast, but the ultimate gain will be greater and surer.

#### Display.

In stimulating sales of Bicycles and sundries display plays a leading part. The first impression a customer receives of the wheels unconsciously but powerfully influences him either fa-

vorably or not. The same is true of the casual observer, who, however, may be the future purchaser. If, in passing, he sees a polished window containing one or more wheels and a line of sundries tastefully or uniquely arranged, he is attracted by it, remembers it, and is apt to call it to the attention of friends. Whatever will pleasantly attract attention in a window or store display cannot fail to bear good fruit. With a little ingenuity many unique ways of attractive window display can be devised at small expense. Determine first the object, then the effect you desire produced, and the method of attainment will be much simplified.

#### Advertising.

Advertise the wheels, using cuts wherever possible as adjuncts to the descriptive matter. Think and do something that your competitor is not doing to bring your name and goods prominently before the public. The more unique the better, so long as it remains attractive. In any case, to obtain the best results the methods employed must be thoughtful and persistent.

#### Personal Effort.

Personal work is an important method of stimulating sales. Become acquainted with the wheelmen; through them often prospective customers will be found. A purchaser in hand is worth three in view. Learn to know your machine thoroughly; be posted as well upon the merits and demerits of your competitor's wheel. Never run down another Bicycle, but stand or fall upon the excellencies of your own. When talking the wheel do it systematically, point by point. Be tactful, patient, courteous to your customer. Be charitable in references to other wheels, but in every way work hard to further the interests of your own, and you will find, from increased profits, that the sale of Bicycles in the retail Hardware store is not a failure, but a pronounced success.

### Combining Bicycles and Hardware.

BY T. W. STAKE.

THERE is probably no article under the head of Sporting Goods that has grown so rapidly in favor as the Bicycle. It seems only a few years ago when the Bicycle was almost unknown in this country and to see a rider on his wheel was quite a curiosity; but now the Bicycle riders on good roads are almost as numerous as pedestrians.

#### In the Hardware Trade.

The proper place to find Bicycles, in my opinion, is either at a Sporting Goods store or a Hardware store. When I first went into the Sporting Goods (principally Guns) business, some 17 years ago, we used to sell the bulk of our goods to the gunsmith; but when competition grew sharper, and it was necessary to carry a large stock and push the business properly, then the Hardware dealers took hold of

Guns, and now nearly every Hardware house in the country handles them, and the gunsmith remains what he was 20 years ago (with a few exceptions).

#### Bicycle Department.

The Hardware store is the place to find these goods, and those who take them up first will have the cream of the trade. To a great many Hardwaremen it will seem quite a task to take up this new line. This can easily be overcome. Bicycle riding has become so popular that in nearly every store some one will be found who either rides or takes an interest in the goods. To make a success of it some one person (or more if the business warrants it) should have charge of this department. A space, say about 10 x 15 feet, to begin with, on a platform raised about 8 inches higher than the main floor, with a light ornamental railing around it, so that the goods can be better seen and easier handled on this platform, could be carried a complete line of wheels, and in a showcase a sample line of Lanterns, Bells and other sundries.

#### Accommodations for Wheelmen.

I would suggest having a desk and several chairs in this department as an inducement for wheelmen to linger at the store. Have the Bicycle newspapers, catalogues, &c., there. A wheel, being a high priced article and not bought on the spur of the moment, is the reason why customers should be made to feel at home in the store. Clerks in this department must be obliging, courteous and patient. Be willing to explain the good points in the wheel controlled, and try in this manner to gain the confidence of prospective customers. Keep the stock well cleaned and bright.

#### Extent of Assortment.

I believe, to do the business properly, it is necessary to carry a full line of wheels, consisting of one high grade line, a medium line, then a juvenile line, with a sample or two of ladies' wheels. These goods are usually bought from three different makers. A small line of Lamps, Bells, Tools and other sundries can also be kept in stock profitably. A great many dealers might be afraid to go into wheels, as they think the expense of putting in a stock too great. I would say that for \$500 you could get a good sample line of ten wheels, assorted, with a full line of sundries. This would make as good an assortment as a great many dealers who have been in the trade some time can show.

#### Repairing Bicycles.

It is not necessary to have an elaborate repair shop, as a great deal of the repairing can be done by a locksmith, usually employed in stores, or any rider with mechanical ideas, although in larger cities, where there is enough work to warrant it, it would pay. Then it is necessary to have a man especially for that work and carry a stock of parts, screws, tires, &c.

There are numerous ways of

#### Stimulating the Wheel Trade.

Organizing or joining clubs is one of the best methods. Be liberal with printed matter, such as catalogues, calendars (supplied by makers). If there

are races in the town give a prize, such as a Lantern, for instance, in order to keep your name before the public. When any large race has been finished secure photographs of the winning riders and place them in your windows; and lastly,

#### The Installment Plan.

The retail Hardware dealer often gives long credit on Hardware, and in some cases it may be advantageous to give it on Cycles. By getting properly secured he can often make a sale this way easier than if customers are compelled to pay cash.

### Recent Accessions to the Hardware Club.

THE FOLLOWING gentlemen were admitted to membership in the Hardware Club of New York at a meeting of the Board of Governors, held on December 21:

- JAMES COCHRAN,  
Lalace & Grosjean Mfg. Company,  
New York.
- R. L. COLEMAN,  
Western Wheel Works,  
New York.
- GEORGE H. COOK,  
50 Broadway, New York.
- THOMAS H. DELANO,  
102 Chambers street, New York.
- JAMES GAUNT,  
365 Canal street, New York.
- C. F. LINSLEY,  
Bradley & Hubbard Mfg. Company,  
Meriden, Conn.
- CHARLES LOEB,  
8-14 Grand street, New York.
- ISAAC B. MARKEY,  
13 Barclay street, New York.
- ISAAC MILBANK,  
71 Hudson street, New York.
- IRA MILLER,  
United States Whip Company,  
Westfield, Mass.
- WILLIAM T. NEWELL,  
35 Park Place, New York.
- L. H. PEASE,  
Stanley Works,  
New Britain, Conn.
- HENRY R. PEIRSON,  
Peirson Hardware Company,  
Pittsfield, Mass.
- GEORGE N. ROBINSON,  
James Beggs & Co., New York.
- HENRY E. RUSSELL,  
Russell & Erwin Mfg. Company,  
New York.
- CHARLES F. SMITH,  
New Britain, Conn.
- EDMUND T. SMYTHE,  
Wiebusch & Hilger Company,  
New York.
- L. A. STOUT,  
81 Warren Street, New York.
- ALBERT H. TATUM,  
Whitall Tatum Company,  
New York.

GATE CITY FILTER COMPANY, 35 Murray street, New York, are bringing out a medium grade of Pottery in connection with their Stone Filters, which is intended as a connecting link between their gray stoneware and china. It is stoneware, uniformly molded so that the several parts always fit, with a bluish tint and decoration, and is offered as a grade better than the common stoneware, much more attractive in appearance, at a moderate advance in cash.

## Bicycle Notes.

KEATING WHEEL CO., Holyoke, Mass., will market for the coming year the following Keating Bicycles: Light roadster, frame 24½ inches high, weight 19 pounds, list \$100; light roadster, frame 22½ inches high, weight 19 pounds, list \$100; Rational, ladies' diamond frame, weight 19 pounds, list \$100; Model 10, ladies' drop frame, regular hight, weight 23 pounds, list \$100; Model 10, ladies' drop frame, 2 inches lower, weight 23 pounds, list \$100; Model 11, ladies' straight frame, regular hight, weight 22 pounds, list \$100; Model 11, ladies' straight frame, 2 inches lower, weight 22 pounds, list \$100, and the Keating Special racer, weight 17 pounds, list \$125. Among their '95 improvements the company mention new steering head, new front and rear hubs, new sprocket drum, 5-inch tread, new method of attaching the front sprocket, crank and pedal; new design of sprocket teeth, ½-inch chain, direct tangent spokes without bend at the head, new detachable brake, three styles of handle bars, cork grips, and bearings positively dust proof. An improvement to which special attention is called is a ball case from which the balls may be instantly removed without any special tool, but which will not allow the balls to fall out when the axle is removed. The wheels will be equipped with wood or steel rims, detachable or cemented tires and Keating saddles.

HITCHCOCK MFG. COMPANY, Cortland, N. Y., advise us that they will be at the Cycle show in Chicago with all the different styles of their Motor Cycles, also with a full line of high grade Bicycles. They will also make an exhibit of the same kind at the New York Cycle show, being prepared in each case to make contracts and to consign territory to both jobbers and dealers.

THE BRIDGEPORT GUN IMPLEMENT COMPANY, 313-315 Broadway, New York, issue an illustrated price-list of all the Bicycle Sundries manufactured by them. The line includes Cyclometers, Whistles in a number of styles, Lubricants, Emery Paste, Oilers, Screw Drivers, &c.

POPE MFG. COMPANY, Hartford, Conn., issue for 1895 the tenth annual Columbia Desk Calendar, with new thoughts. The calendar is in pad form, with a metal back, the dates covering the entire year. Each sheet contains a quotation or remarks pertinent to Bicycles, and many of the sheets are enlivened by appropriate illustrations. Besides these and the dates, the sheets have a blank space for memoranda.

GEORGE N. PIERCE & Co., Buffalo, and 107 Chambers street, New York, issue an advance sheet illustrating the

1895 Pierce and Queen City Bicycles pending the issue of their Art Catalogue, January 1. Pierce Cycles are referred to as a high class, stanch and light line of wheels, and the Queen City as representing their line of juvenile Bicycles. The company will exhibit at the New York and Chicago Bicycle shows.

J. H. ROBLEY, formerly at 142 Chambers street, New York, has recently removed to 1 Park place, corner Broadway. He is representing, as he has for some time past, the Falcon line of wheels made by Yost Mfg. Company, Toledo, Ohio. He is admirably situated with regard to the retail trade, which he is now giving attention to, although the larger portion of his business is with the jobbers. He finds that an increasing number of Hardwaremen are adding Bicycles to their stocks. In addition to Bicycles he carries a full line of sundries, including Lamps, Bells, &c., and will soon issue a catalogue of these goods. He still continues handling a line of Hardware specialties, including Pullman Sash Balance Company's Sash Balances and Spring Hinges, Colt's Clamps, Howarth Sash Centers and Ward & Doron's Thermometers.

THE INDIANA BICYCLE COMPANY, Indianapolis, Ind., have established a branch store at Buffalo, N. Y., where the Waverly Bicycles will be sold by an experienced salesman.

THE WINTON BICYCLE COMPANY, Cleveland, Ohio, issue a tastefully arranged catalogue under the title of the Winton Bicycle Book. The line of Wintons offered for the coming season include Model 8, weight 24 pounds, list \$100; Model 9, weight 25 pounds, price \$100; Model 10, weight 21 pounds, list \$100; racer, Model 11, weight 17 pounds, list \$125; Model 12, weight 20 pounds, list \$100; racer, Model 14, weight 16 pounds, list \$125; and ladies', Model 15, weight 23 pounds, list \$100. The foregoing wheels are shown, and interspersed through the pages are illustrations showing the evolution of the Bicycle from its most crude form in 1816, through the succeeding years to the present time.

BIGELOW & DOWSE COMPANY, 229 Franklin street, Boston, announce that they will continue to act as sole New England agents for the Crawford Bicycle, and that they will carry in store a complete line of the 1895 Crawford machines. The 1895 line will consist of eight models, listing from \$40 to \$75.

MASON & PARKER, Winchendon, Mass., are offering to the trade a new family Cleaver, made entirely of steel except the handle, and the manufacturers state that the workmanship and finish of this article are first class. They are packed one dozen in a box, with a card that tells the story. The Cleaver is shown in our advertising columns this week and it sells at retail for 25 cents.

## Stock-Taking.

### Correction.

In the article on taking stock by C. T. Rosenthal, which was printed in our last issue, errors occurred in the description of the stock sheets as printed in our columns. The weights of Eagle Anvils and Solid Box Vises and the numbers of Horse Nails were given as dollars—a mistake which was probably recognized by our readers. The correct form of the stock sheet is as follows:

3 Standard Bellows .....	32 in.
2 " " .....	34 in.
1 " " .....	36 in.
<hr/>	
1 Eagle Anvil .....	70 lb.
1 " " .....	80 lb.
<hr/>	
1 Solid Box Vise .....	35 lb.
2 " " .....	40 lb.
1 " " .....	50 lb.
<hr/>	
25 lbs. Essex Horse Nails .....	No. 5
125 lbs. " " " .....	No. 6
375 lbs. " " " .....	No. 7
550 lbs. " " " .....	No. 8

### Odds and Ends, Tools, &c.

Those familiar with the work of pricing inventories are well aware of the vexatious labor connected with finding descriptions and deciding the correct inventory prices for the tag end of stock—a small quantity of which goods merchants, perhaps, have been induced to put in stock in response to a spasmodic demand, or articles bought to fill special orders and which have been left on their hands. Goods thus accumulated may not be in the merchants' regular line and of which they have no catalogues. Although these goods may not amount to more than 5 or 10 per cent. of the stock, the pricing entails more trouble and worry than the other 90 or 95 per cent. of the inventory. It is unsatisfactory to take the prices from the inventory of last year, which was probably taken from that of the preceding year, as they may be far from representing the actual value at the present time. This class of goods are apt to include special tools, supplies for mills, mines, machinery, &c., which are manufactured by makers in widely scattered portions of the country, and seldom included between the covers of any one catalogue.

Charles A. Strelinger & Co., Detroit, Mich., are about issuing a catalogue, the work of several years, to be known as the

### Book of Tools;

a comprehensive work, many features of which are useful and helpful, and not commonly found in books of this character. The catalogue is designed for the use of manufacturers and merchants, also for those using tools, supplies, machinery and similar goods. The articles illustrated and described, and on which prices are given, are those used by machinists, engineers, blacksmiths, model makers, founders, molders, draftsmen, inventors, amateurs, and in manufactories, mills, mines, &c. The company's advertisement in this issue refers particularly

to the usefulness of the catalogue in facilitating the pricing of difficult portions of inventories.

## Use of Catalogue in Stock Taking.

ANY SUGGESTIONS that lighten the labor of the annual or semi-annual inventory, at the same time contributing to the correctness of the result, are worthy of consideration. To manufacturers especially, in determining the value of finished goods either at factory, warehouse or at branch establishments, and to jobbers who have their own catalogue, the following method may be of service:

### Preparing the Catalogue.

A fresh catalogue can be prepared a little in advance by pasting in any pages, circulars or appendices issued during the year, and occasionally blank pages can be interleaved if a page is likely to be crowded. As there are always more or less of odds and ends, a few leaves can be placed at the back of the book for items having no particular place.

### Ease in Entering Quantities.

The entry clerk, or whoever takes from the call clerk, should be familiar with the catalogue so that he can find the right page as fast as his partner calls, especially as a careful caller more or less verifies the count noted on each slip as he proceeds. The entry clerk thus has nothing but quantities, expressed in a few figures, to put down opposite the printed line describing the goods. Even closely printed pages, as of bolts, screws, &c., are easily utilized in this way,

### The Ordinary Method.

A common method has been to use a blotter or blank book in the first stage of such work and then copy and arrange the mass afterward—a tedious undertaking, and often unsatisfactory when completed. On the other hand, by the use of a catalogue very little writing need be done; quantities are made to harmonize with the form in the book, as thousands, grosses, hundreds, dozens, sets, pairs, each, &c., which are not always correctly expressed on the shelf slips by careless or incompetent clerks.

### Errors Corrected.

These inaccuracies are apparent at once to the entry clerk, who has little to do, and differences are adjusted on the spot, while the arrangement of the stock for copying is complete when that stock has been entered in the catalogue. Sometimes a section of stock is skipped inadvertently, but the catalogue acts as a telltale to those familiar with the stock. The catalogue, it is understood, is only a temporary expedient for assembling the innumerable items in a large stock in their proper places, to be copied neatly into a blank book later.

### Advantage in Pricing.

When the delicate work of pricing begins, each page naturally tallies with the page in the catalogue containing prices, costs, &c. Then, too, instead of having two or more items of the same goods from which to take from one to six discounts, if properly done, there should be no such duplication. Principals whose time is valuable, wishing to glance over the record before copying, can skip the trivial portions and concentrate their attention on what is important.

### Interruptions and Distractions.

If a quick result is required in an exceptional case, the catalogue could be priced in the office in advance in a leisurely way, although in most instances it is best to price after the stock is taken down. Those experienced in stock-taking are familiar with the interruption and distraction at such times, but with such a skeleton to fill in the mind is relieved of much, while the form offers many practical suggestions as the work progresses. Obscure articles in a large book can be quickly located by the index as a last resort.

### Convenience of Index.

Comparisons with preceding inventories are practically on the same basis, while future reference at any time during the ensuing year is quickly made by referring to the index, if the inquirer is not familiar with the copy. Often, in addition to the goods on the shelves, there is reserve stock in original packages, similar goods laid out but not charged, returned goods billed but not yet received, and often goods *en route* from mill or factory billed but not received, &c., all of which must be considered as stock on hand.

### Scattered Goods.

The various items are quickly assembled, each on its proper page, the figures roughly jotted down and added together afterward when being transferred. As stocks are usually run as low as possible before an inventory and replenished immediately afterward, one can quickly run through the important goods in this way as soon as the count is finished. After this the extending and footing is merely clerical work.

## Escher & Co.

ESCHER & CO. have established themselves permanently in this country at 107 Duane street, New York. The first loft at this address, 75 x 25 feet, has been leased and Charles Quastenberg, one of the firm, is in charge of the business here. This concern are said to be the largest producers in the world of Belgian and German Oil and Water Hones for razors. They likewise manufacture and deal in Turkish stones for edge tools, Italian Oil Hones, Rubbers (so-called) for water hones, stones for polishing gold, used largely by jew-



elers, watchmakers, &c. A high grade stone produced by this firm is what is known as gold testing stone. It is exceedingly hard, of jet black color and sold at upward of \$3 per pound. Gold is tested by rubbing lightly on it and then treating with nitric acid. Base metals are consumed, gold remaining, while the stone, which, like the water hones, is found in river beds, remains uninjured. They have factories in Sonneberg and Thuringen, Germany, and Varsalien, Belgium. From their houses on the Continent the goods in which they deal are shipped to most foreign countries. They carry a large stock in this country from which to promptly execute orders, and importation orders, if necessary, are cabled and got through the New York Custom House in 12 days from receipt of order. Their catalogue, issued abroad, contains 52 pages of stones of almost every conceivable shape and kind.

## Where Are We Drifting?

### A Jobber's View of the Situation.

WHEN we think of the increased cost of doing business, and then figure the decreased profits, should we not find a remedy to at least even up the difference.

#### Growing Expenses.

Taxes, insurance, rents and salaries are higher. We have new expenses; the telephone is a necessity; we must use the telegraph more frequently, as this is a fast age and customers cannot wait for lightning mail trains. The demands of charity are more numerous and you must give larger amounts. Your customers take longer time and losses are more frequent. Traveling expenses are as much, if not more, and still with all these facts staring us in the face some of us are willing to book orders for delivery three or four months ahead and guarantee prices.

#### Guaranteeing Prices.

Oh, yes; guarantee prices, sure, and for what profit? One dollar a ton on Plain and Barbed Wire, 5 cents a keg on Nails, 5 cents per 100 feet on Wire Cloth, 5 per cent. on Poultry Netting, 25 cents a dozen on Screen Doors, 5 per cent. on Steel Goods,  $\frac{1}{4}$  cent per pound on Binder Twine, Wool Twine and Rope;  $2\frac{1}{2}$  per cent. on loaded Shells; Bolts, Screws, Files, &c., about the same. I guess it is safe to include everything but Cutlery. When you take out all the staple goods that are sold without any profit you make a hole big enough to throw the rest through without touching.

#### The Remedy.

Now, what is the remedy? I think I can prescribe for the invalid, so he will get better at any rate. He is surely not in the pink of condition now. We must admit that there is only a certain amount of goods required to supply the demand. How is the sensible way to supply this demand? Is it best for the average retailer to buy goods three, four or six months before he needs them, or would it not be better for him to wait until the season arrives for seasonable goods? He can get them in

a few days after ordering, and is not nearly so liable to overstock himself.

#### Buying Goods Ahead.

This habit of manufacturers and jobbers hammering away at the retail trade for orders for goods they will not need for six months is a system that in my opinion is very demoralizing. You must guarantee prices; date bills 60 days to four months ahead; take the chance of an assignment, or of some competitor, for a legitimate reason offering a lower price, which you must meet or offend your customer. You are taking all the risk. The customer takes none.

Another demoralizing factor is

#### The Greed of Jobbers.

They want the earth and the man in the moon. They will drum trade 500 to 1000 miles away from home and let some one gobble up an order within 25 miles of their home. It is natural for a retailer to buy from a manufacturer or jobber that can give him quick delivery and low rate of freight; but the distant manufacturer or jobber offers some inducement, and in most instances he can't afford to do it. Whether he gets the order or not he establishes a price that soon becomes common. Western or Southern jobbers drum trade as far East as New York, and Philadelphia and Cleveland jobbers go right down South and out West and sell goods.

### Jobbers Should Keep to Their Territory.

Now, doesn't business sense say: Southern and Western jobbers, look after trade in your territory, and Eastern jobbers look after your trade, and we will all sell as many goods and do it with less expense and more profit. Think how ridiculous it is for goods that are made East to be shipped to jobbers a thousand miles away, and then reshipped right back again; and the same thing with goods made West, shipped East and then back again, often to the same town in which they were manufactured. You all know this is not an uncommon thing. Some person pays this freight, for railroad corporations do not carry freight for nothing, and the jobber is the fellow who does it. The customer says freights are against you. The reply comes, We will equalize freight—sometimes that means pay it all.

#### Live and Let Live.

Push in business is what we want; but I am sure that with the same energy confined to territory that is reasonably near our places of business we will sell fully as many goods and avoid this sharp competition, that is bound to come when you tread on another man's toes. Let us not forget that the other fellow is, no doubt, just as able to sell goods close as we are, and also remember that no one concern can get all the trade.

## Letters from the Trade.

*Our readers are invited to discuss in these columns questions of trade interest connected with the manufacture or sale of Hardware. We shall be pleased to have a free expression of opinion on subjects deserving the attention of Hardware merchants and manufacturers.*

In *The Iron Age*, November 29, a communication was published in which our correspondent referred to the attitude of jobbing houses to new goods. The buyer to whom the new article was presented made the point that it would not pay them to attempt to introduce it, it being, in his judgment, the province of the inventor and manufacturer to create the demand and of the jobber to handle the goods when demanded by the trade. The inquiry of our correspondent was as to whether the buyer was right or wrong in this view of the matter.

This is a question which has been brought home in a practical way to many a manufacturer who found the jobbers unwilling to handle a new article of recognized merit because it was easier and more profitable for them to sell goods with which the trade are familiar.

The letter which we print below touches upon this general subject and will be read with interest:

Permit us to say a few words in regard to the communication in your issue of November 29, in regard to the position of buyers in reference to new articles. The buyer was right, if he was a salaried buyer working under instructions; but if one of the firm,

and at liberty to use his judgment, he was all wrong. His judgment with regard to the lock was that it was a winner. In these days, the business man who wins is the one who backs his judgment.

The reputation of the house, or manufacturing firm, offering the new article should be taken into consideration. It is evident they would not have gone to the necessary expense of getting out the new article unless, in their judgment, it was in some degree an improvement over anything in the market with which they were familiar. Again, if it was a patented article offered by the manufacturer, he was in a position to give the jobbers taking hold its exclusive sale in their line for their locality, so that the person taking hold of and pushing it would reap the reward due them for their labors.

Any one at all familiar with the history of the greatest inventions of modern days will understand that the difficulties incident to introducing them to the public have been well nigh insurmountable. Who has read the pathetic account of the trials of Howe, the inventor of the sewing machine, without cursing the stupidity of humanity; or the trials of Morse, the inventor of the telegraph, without wonder?

An article invented by the writer was shown to a friend engaged in the line that would naturally handle it, and his opinion asked. After looking at it, he said, "Has there been any demand for this article?" which was

answered in the Yankee way by the question, "Was there any demand for the telegraph before such a thing was known?"

The class of buyers illustrated in the article referred to seem to forget that if the manufacturer has perfected a machine for placing the goods upon the market, and got it in actual operation, he will have no use for such buyers or the houses they represent.

The inventor sees a place for a certain article combining advantages over anything he has ever seen for a particular purpose. He sets to work upon a combination of matter that will accomplish the result he has had in mind. He is successful; but he is not a merchant; his business is inventing, and he concludes that his business is done when he has produced the article in marketable shape. He naturally looks to the dealers, whose business it is to market goods. Imagine his feelings of disgust when he runs against a buyer who insists that before offering it to the public the public must demand the goods.

Many an excellent invention has been lost to the public by reason of the fact that the inventor lacked the business ability and training necessary to introduce it, and dealers to whom it was offered lacked courage to back their judgment. NACEFAS.

### Trade Notes.

**FAYETTE R. PLUMB**, the well-known Philadelphia manufacturer, has been elected one of the vice-presidents of the Union League Club of that city.

**W. M. MOONEY** of **W. M. Mooney & Co.**, Ausable Chasm, N. Y., has severed his connection with the Canada Horse Nail Company and for the future will devote himself entirely to the Ausable Chasm works, the sole control of which he has acquired, the plant at Montreal having passed into the hands of Mr. Ferrier.

**C. E. DEWEY** has been elected secretary of the local business men's association at Kenosha, Wis. Mr. Dewey is in his thirty-fourth year, and has for the past 12 years been associated with C. A. Dewey, Hardware and Implement merchant of Kenosha.

**H. M. GAY** of Milwaukee will continue during 1895 to represent the Woodrough & Hanchett Company of Chicago on the road. January 1 will inaugurate Mr. Gay's twenty-ninth year as a traveler in the Hardware line. He will cover his old route of Wisconsin and a portion of Michigan and Minnesota.

**ALFRED FIELD & Co.**, 93 Chambers street, New York, who represent in this country Joseph Rodgers & Sons, Sheffield, England, are sending out an illuminated card  $11\frac{1}{4} \times 18$  inches, calling attention to this well-known brand of Cutlery. Aside from the name and address of the cutlers are the royal arms of Great Britain in the center overhead, with the firm's trade-mark granted to the house in 1682 by the Cutlers' Company of Hallamshire. It is tastefully gotten up in a number of colors, and arranged for hanging.

**THE MANY FRIENDS** of Irving Lawrence of the Stanley Works, 79 Chambers street, New York, who for some weeks has been critically ill, will be glad to learn that he is now convalescent, and may soon be expected at his desk again.

**THE JAPANING DEPARTMENT** of the American Wire Goods Company, Lowell, Mass., took fire on the 19th inst., the roof of the building being almost destroyed, and the ovens in which the japaning is done being

damaged. The loss is estimated at \$2000, covered by insurance. The company advise us that they have already commenced to rebuild and repair, and they expect to be in a position to fill orders promptly in a few days.

**EATON & NORWOOD**, Bellows Falls, Vt., write us in correction of a paragraph which appeared in our last issue, under the head of "It is Reported." The facts are that Eugene Norwood of the firm will spend the winter in New Mexico with his family on account of the health of Mrs. Norwood. He will, however, retain his interest in the business, which will be under the management of E. A. Eaton, senior member of the firm. George I. Whitney has accepted a position as bookkeeper and salesman in the store during Mr. Norwood's absence.

**THE F. H. LAWSON COMPANY**, 188-190 Main street, Cincinnati, Ohio, have purchased the extensive plant of the late George D. Winchell Mfg. Company, and have added new improved machinery, increasing the capacity for turning out goods in larger quantities. In an announcement of this acquisition they refer to the high grade of the goods made by the Winchell concern, which include Pieced Tinware, Japanned Ware, Galvanized Iron Ware, Toilet Ware, Water Coolers, Coal Vases, Street Lamps, Galvanized Iron Oil Tanks and other specialties.

**BRONSON & NEAR**, Cleveland, Ohio, and 35 Warren street, New York, have just closed a contract to furnish the Wrought Iron Range Company, St. Louis, Mo., during 1895 over 100,000 pieces of Steel Hollow Ware, which will be supplied with the company's Home Comfort Ranges. This ware is manufactured for Bronson & Near by the Novelty Stamping Company of Bellaire, Ohio, who manufacture also a line of Enameled Ware, for which Bronson & Near are the general selling agents. The above order was secured by A. E. Bronson when in St. Louis last week.

**SCHULTE, LOHOFF & Co.**, Evansville, Ind., have prepared a miniature Adze, handsomely finished, which they are distributing, with their compliments, among their trade as paper weights. The tool, which is 5 inches in length and weighs about 12 ounces, is of solid steel, hand forged, nickel plated and etched with the name, address, &c., of the manufacturers. The company are manufacturers of Edge Tools and Hammers, and, though comparatively young in the business, having started six years ago, their goods have taken their place among those of the older manufacturers. The company advise us that they have distributed upward of 500 of the miniature Adze in the United States, besides sending many to Hamburg, Sheffield, Dublin, city of Mexico and other foreign points.

**PATTERSON, GOTTFRIED & HUNTER**, 146-150 Centre street, New York, are sending out a neat hanger, embodying a novel method of calling the attention of the trade to Arcade Files, for which they are agents. Along one side of the card is a Mill File in emery. The card calls the attention of the recipient to the utility of the emery File as a match scratcher, but suggests a trial of an Arcade when in want of a real File. The firm deal in Machinery, Metals, Tools, Hardware and Supplies.

### Price-Lists, Circulars, &c.

**JOSEPH LAY & Co.**, Ridgeville, Ind., Acme White Wash Brushes. The Brushes are made in styles from A to Q, packed one half dozen in strong paper boxes.

**MECHANICS' SUPPLY COMPANY**, Quebec, send a combined foot rule and calendar, calling attention to their line of Tools and Supplies for plumbers, gas and steam fitters. The rule is of paper, four fold, tastefully printed with imitation brass ends; having inch markings on one side and the dates of the year on the other side.

**INDIANA WIRE FENCE COMPANY**, Crawfordsville, Ind., have prepared a wall calendar for 1895. This is an exceedingly artistic piece of work, a tinted photogravure of "The Sirens" by Paul Thumann occupying the upper portion of the large card, while leaflets for the months are attached below.

**BUFFALO SCALE COMPANY**, Buffalo, N. Y.: Buffalo Standard Scales. An illustrated price-list is devoted to the following Scales: Postal, Even Balance, Meat, Butter, Platform, Columbian Automatic, Tea, Drug, Counter, Grocer, Double Beam, Express Package, Platform, &c. The catalogue is provided with an index and a telegraphic code.

### The Heavy Hardware Jobbers' National Union.

**A** WELL ATTENDED meeting of the Heavy Hardware Jobbers' National Union was held Friday, 21st inst., in the Southern Hotel, St. Louis. The meeting was called principally to enable the members to interchange their views regarding matters with which this department of the Hardware trade is interested. An invitation was read from the National Hardware Association inviting them to join this new organization. The invitation was fully discussed, and the determination arrived at was that while in some respects the objects of the two associations were similar, yet it was generally agreed that the heavy hardware jobbers' interests would be subserved to better advantage by keeping the two associations separate. It was deemed advisable, however, that each member of the association should individually become a member of the National Association.

**George Deming** of Cleveland, Ohio, presented the question of adopting net prices in a very able manner, and his remarks were listened to and considerable interest was shown in this subject. The final decision was that the present time was not an opportune one for adopting net prices.

The matter of reducing expenses was thoroughly discussed, and the question of how to get more money for goods was gone over in a very thorough manner. Various suggestions were made regarding boxing, cartage, &c., which will no doubt result in much good later on. The St. Louis members of the association tendered the visiting members a banquet at the Mercantile Club, where covers were laid for thirty guests. The toasts were largely impromptu, and general good feeling prevailed throughout the evening. The next meeting of the association will be held in Louisville, Ky., in March, 1895. The officers for 1895 are as follows: President, S. D. Kimbark, Chicago, Ill.; Vice Presidents, Gaius Paddock, St. Louis, Francis Boyd,

Milwaukee, Wis., W. B. Dean, St. Paul, Minn.; Treasurer, Robert E. Brier, St. Louis; Secretary, Charles T. Brace, St. Louis. The Executive Committee is composed of the following gentlemen: J. J. Parkhurst, Chicago, Ill.; C. R. Blake, St. Louis; Robert Donahue, Burlington, Iowa; George Deming, Cleveland, Ohio; J. J. Slatterly, Louisville, Ky.

## Calendars for 1895.

**T**HE 1895 CALENDAR of the Winchester Repeating Arms Company, New Haven, Conn., calls attention to Repeating Rifles, Shot Guns, Single Shot Rifles and Cartridges. Above the date sheets is a scene in colors representing hunters complacently viewing the remains of a bear. The picture, which is in colors, is entitled "Success," by A. B. Frost. The picture under the date sheets is by the same artist, and is entitled "An Unexpected Chance."

WILLIAM STAIRS SON & MORROW, Halifax, N. S., send a calendar calling attention to Heavy and Shelf Hardware, Ship Outfits and Fishing Supplies; also to Boiler Makers', Machinists', Plumbers' and Sanitary Supplies and Mining materials.

THE 1895 CALENDAR of Samuel H. Blackwell, Fairfield, Maine, enumerates goods composing a well assorted stock of Hardware, House Furnishing Goods and Builders' Supplies, and is accompanied by a circular letter to his trade. The letter reviews the business situation during the past year, and calls attention to the quality of goods he handles and to the fair treatment accorded customers.

INDIANA WIRE FENCE COMPANY, Crawfordsville, Ind., call attention on an 1895 calendar to their line of manufactured goods, including Plain and Barbed Wire, Wire Nails, Fence Staples, Wire Stretchers, Posthole Diggers, Lawn and Poultry Fencing. Date sheets are attached to cardboard, upon which is an engraving representing The Sirens.

F. E. MYERS & BROTHER, Ashland, Ohio, issue an extended hanger, a yard or more in length, on which are illustrated Pumps and Hay Tools manufactured by them. A colored picture near the top of the hanger represents a haying scene, below which date sheets are attached.

THE UNION METALLIC CARTRIDGE COMPANY, Bridgeport, Conn., are sending with their compliments an 1895 calendar calling attention to Sporting and Military Ammunition. The hanger upon which the date sheets are fastened has an attractive colored picture of children asleep in the woods.

## It Is Reported—

### Colorado.

That the ROCKY FORD Hardware house of W. S. Swink & Co. has been sold to a new firm consisting of P. J. and A. L. Reife.

That the Pueblo Hardware Company, PUEBLO, have taken the agency for the Pope Mfg. Company's line of Bicycles, including the Columbia, Hartford and Wizard. They are intending to add a complete repair shop to their establishment.

### Connecticut.

That the Hardware store of J. E. Wadsworth & Sons, at NORTH HAVEN, was robbed on the 18th inst., a quantity of Pocket Cutlery being taken.

### Illinois.

That William Glanville of STOCKTON has purchased a Hardware store at DAVIS, which he will take possession of on January 1.

That the Hardware store of Emanuel Holbrook, BATAVIA, was robbed on the 19th inst., about \$600 worth of Guns, Revolvers, Razors and other articles being taken.

That the Geo. Eidman Implement Company, BELLEVILLE, have been incorporated. The capital is \$5000.

### Indiana.

That J. D. Allman has purchased H. Sheetz's interest in the Hardware firm of Allman & Sheetz, REMINGTON, and will hereafter conduct the business under his own name. Mr. Sheetz has as yet made no plans for the future.

That the Hardware store of E. B. Schenck, at MOUNT VERNON, was entered on the 9th inst., and a quantity of Revolvers and Knives stolen.

That Victor Bros., Hardware and Tinware, FORT BRANCH, have sold out their business.

### Iowa.

That M. F. Logan has purchased John T. Smith's interest in the Hardware business heretofore conducted under the style of Smith Bros., at SHELDON. The style will hereafter be Smith & Logan. Mr. Smith intends spending some time at Hot Springs, Ark., in the hope of recuperating his health.

That William Meyers has purchased the Van Kirk Hardware stock, at SWALEDALE.

That G. W. Garner & Co., Hardware, &c., WINTERSET, have opened a new store.

That J. B. Jewell, Hardware merchant, FOREST CITY, has sold out to S. C. Gardner.

That the Gillette Hardware Company of SIOUX CITY have been incorporated, with a capital of \$20,000, by T. H. Green, T. H. Preston and C. E. Hughson.

### Kansas.

That the Hardware firm of Shelden & Shelden, TOPEKA, have been dissolved. Marion Shelden will continue the business at the old stand.

That the McKnight Wholesale Hardware Company of WICHITA have been incorporated. The company are composed of the members of the old firm of McKnight & Co., J. H. McKnight being the president.

### Massachusetts.

That the store of Marble & Wilson, Stoves, Hardware, &c., ASHBURNHAM, was robbed a short time since.

### Michigan.

That T. S. Crosby has purchased Richardson & Tiernan's store, at GOBLEVILLE.

That Eugene Reynolds has purchased the interest of E. L. Mather in the Hardware firm of Mosher, Bissell & Mather, BAY CITY. Mr. Mather will shortly leave for Naples, Italy, where he will spend some time.

That the Hix Hardware Company have been organized at JONESVILLE to succeed Gilbert & Hix.

That Jacob Dykema, formerly a clerk for Joseph Berles of GRAND RAPIDS, has purchased the Palmer Hardware stock,

### Minnesota.

That Crabtree Bros., Hardware dealers at HERMAN, have dissolved.

### Missouri.

That T. D. Osborn & Sons, FAIRPORT, have sold their Hardware business to Kennedy & Scholes, the new firm to take possession on January 1.

That the firm of Stoermer & Kiethley, dealers in Hardware and machinery, ST. PETERS, have been dissolved. William Stoermer has sold his interest to Lee Kiethley, who will hereafter conduct the business.

That J. W. Wills' interest in the Hardware business of Wills & Henry, CENTRALIA, has been purchased by R. S. Tucker. Mr. Wills has withdrawn from the firm on account of ill health.

### Mississippi.

That J. F. Small & Co., Hardware merchants, CORINTH, have been succeeded by Small & Elgin.

### Nebraska.

That Jacob A. Wolfe, Hardware dealer, NORTH BEND, has been succeeded by Wolfe & Kelly.

### New York.

That S. E. Gregory's Hardware store, at COHOES, was broken into by burglars on the 17th inst. and 15 pairs of Skates stolen.

### North Dakota.

That Geo. W. Dixon is the successor of Olmstad & Dixon in the Hardware business at OMEMEE.

That Pederson & Anderson, dealers in Implements, at MILNOR, have dissolved partnership.

### Ohio.

That Milton M. Fleming has sold his interest in the Hardware business at DENISON to John W. Finneren, and will go on the road as traveling salesman for W. L. Sharp & Son of Steubenville, Stove and Furnace manufacturers.

That a new firm under the style of Ritter & Shuler has been organized at LEXINGTON.

### Pennsylvania.

That William McKinney & Co. have opened a new Hardware store on the northwest corner of Passyunk avenue and Ellsworth street, PHILADELPHIA.

The Schlett & Sons have opened a new Stove store at 1100 South Second street, PHILADELPHIA.

### Tennessee.

That John D. May has sold his interest in the Hardware store of James May & Co., SWEETWATER, to W. D. Howard, the transfer to take effect on January 1.

### Texas.

That W. A. Young's Hardware store, at BRYAN, was robbed on the 13th inst. That Trice & Lawless, in the Hardware business at LOTT, have dissolved partnership.

### Wisconsin.

That Frederickson Bros., in the Hardware business at CAMERON, have been succeeded by C. Frederickson.

That F. N. Gaskell's Hardware store, at BARABOO, was entered by burglars on the 16th inst., and a quantity of Cutlery taken.

That Mrs. J. R. Smith has sold out her Hardware business, at FOND DU LAC, to Edward Foulkes, who will take possession early in January.

That the Schweers & Nachtwey Hardware Company of SHAWANO have been incorporated. The capital stock is \$20,000, the incorporators being John C. Schweers, Frank D. Schweers and Henry Nachtwey.

*The Hardware trade throughout the country are requested to report business changes, improvements and other matters of trade interest suitable for mention in this department.*

## Paints and Colors.

*It should be understood that the prices quoted in this column are strictly those current in the wholesale market, and that higher prices are paid for retail lots. The quality of goods frequently necessitates a considerable range of prices.*

**White Lead.**—The tone of the market has not turned for the better. Competition is too widespread and keen for anything of that nature being realized at the present time. Besides that is the comparative cheapness of raw material, which permits of corrodors and other producers turning out a good article at moderate price, to say nothing of the more than vague possibility that foreign product may be brought in more freely if prices for



American are raised. No change of importance in values has taken place during the past week, and, it may be needless to remark, business has been extremely slow.

**Red Lead.**—Business has been moderate, yet probably all that could reasonably be looked for at this season of the year. Foreign brands still come forward freely and are offered in a liberal way for future shipment at comparatively low prices. As far as can be learned, however, the bottom figures now are very little, if at all, below those that have ruled for several weeks.

**Litharge.**—There is some irregularity, with prices inclining in buyer's favor, but no radical changes in quotations are openly made. A fair amount of orders for the low grades have been placed, but other sorts are slow, and the Paint trade seem content with buying in a hand-to-mouth way.

**Orange Mineral.**—Foreign brands are still freely offered for future shipment at previous lowest prices, but the element of cost is not at all stimulating and orders are being placed in a perfunctory way only. Domestic product is neglected for the moment. Prices have undergone no radical change, but the market, as a whole, seems rather weak.

**Zincs.**—Orders for American Oxide for future delivery are being placed in a very conservative way, since the general market situation, from standpoint of probable supply, to say nothing of possible livelier foreign competition, acts against other than con-

chiefly in lots of a few hundred barrels, but some larger quantities were taken, and, upon the whole, the market shows somewhat improved tone.

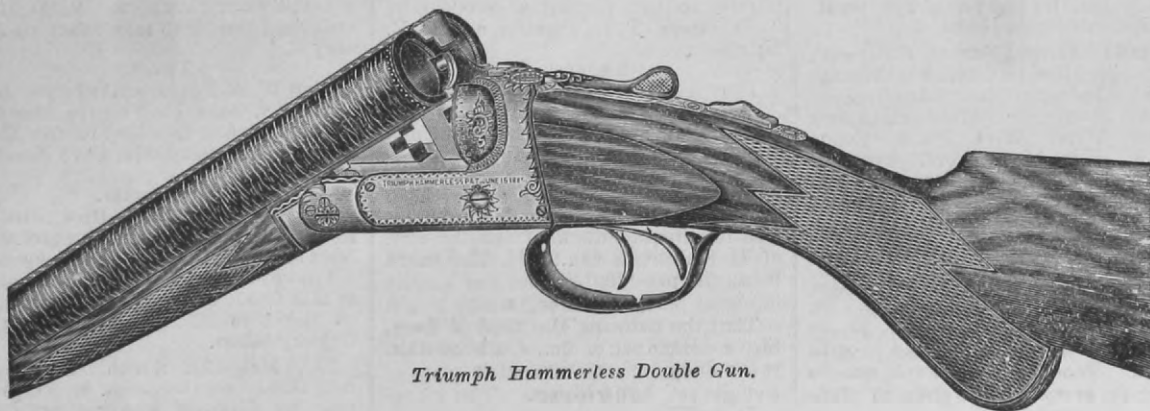
**Lard Oil.**—Only routine business, the volume of which was moderate, has been effected. The demand has shown very little spirit. Prices are held quite steady, however, on the basis of about 55¢ for prime city brands in round lots, since there is no pressure to sell from any quarter.

**Fish Oils.**—In the New Bedford market crude Sperm Oil has been sold at as low as 55¢ and crude Whale Oil at 31¢. These prices are exceptionally low. Some modification of quotations on manufactured products has been made quietly, although not openly quoted, but with little result in the way of stimulating business. Crude Menhaden Oils and products are slow, with little change in prices.

**Spirits Turpentine.**—The movement in price during the past week has not been over  $\frac{1}{4}$ ¢ per gallon. Dealings were commonplace in the extreme and moderate all told. There is nothing really new in the statistical position nor suggestion otherwise of any immediate turn in values. Dealings have been mostly at 27 $\frac{1}{4}$ ¢ @ 27 $\frac{1}{2}$ ¢, as to style of package.

### Triumph Hammerless Double Gun.

The Crescent Fire Arms Company, Norwich, Conn., are manufacturing the Triumph hammerless double shot



Triumph Hammerless Double Gun.

servative policy on the part of large buyers. List prices have undergone no change. Foreign brands are without important change in price and are selling slowly.

**Colors, &c.**—Nothing of unusual interest has transpired in the market for any of the leading lines of Dry Colors, business having been virtually at a standstill, while fluctuations in prices were very narrow. Oil Colors, outside of some few specialties, find slow sale also, and the market for mixed Paints is practically at a standstill at the moment.

### Oils and Turpentine.

**Linseed Oil.**—Remarkable steadiness has characterized the market. In any event city crushers have not changed their prices, nor have the associated out of town producers made any revision, while the frequently disturbing outside element has done nothing to unsettle matters. While thus showing steady tone, the market has been positively dull, as usual at this season of the year.

**Cotton Seed Oils.**—Quite a good business has been done, chiefly at prices on the basis of 24¢ @ 24 $\frac{1}{2}$ ¢ for Prime Crude and 28 $\frac{1}{2}$ ¢ @ 29¢ for Prime Yellow, on the spot, deliveries running to February, inclusive. Dealings were

gun, under the Lancaster patents, as here illustrated. The arm is chiefly notable from the fact that in closing the barrels after reloading the gun is automatically cocked. It has rebounding locks, and the barrels can be taken off and put on again without cocking the arm, and when cocked the hammers can be let down gradually, without the full force of the blow. It is stated that the tipping of the barrels and cocking of the gun is as easy as a hammer gun. The automatic safety bolt can be instantly adjusted to be inoperative by sliding the safety bolt back toward the butt. The lugs are steel and swing on a circle, which facilitates the opening and closing of the gun. The frame is forged. There are two numbers, 1 and 2, made in 12 gauge, 28, 30 or 32-inch barrels, weighing 7 to 8 pounds. Triumph No. 1 has twist barrels, top snap, double bolt extension rib, L shape, patent fore-end, checkered walnut stock, line engraving, diamond matted rib, full choke bored and rubber butt plate. No. 2 is the same except that it has Damascus barrels. This gun is sold at a moderate price. H. & D. Folsom Arms Company, 314 Broadway, New York, are sole agents.

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### National Self Locking Ventilator Irons.

National Hardware and Malleable Iron Works, Thomas Devlin & Co., Philadelphia, Pa., are offering self locking ventilator irons, which are shown in operation in the accompanying illustration. The irons include sash arms F and G, attached to pipe V, operated by arm C. The parts are secured in place by suitable plates, A, brackets, E,

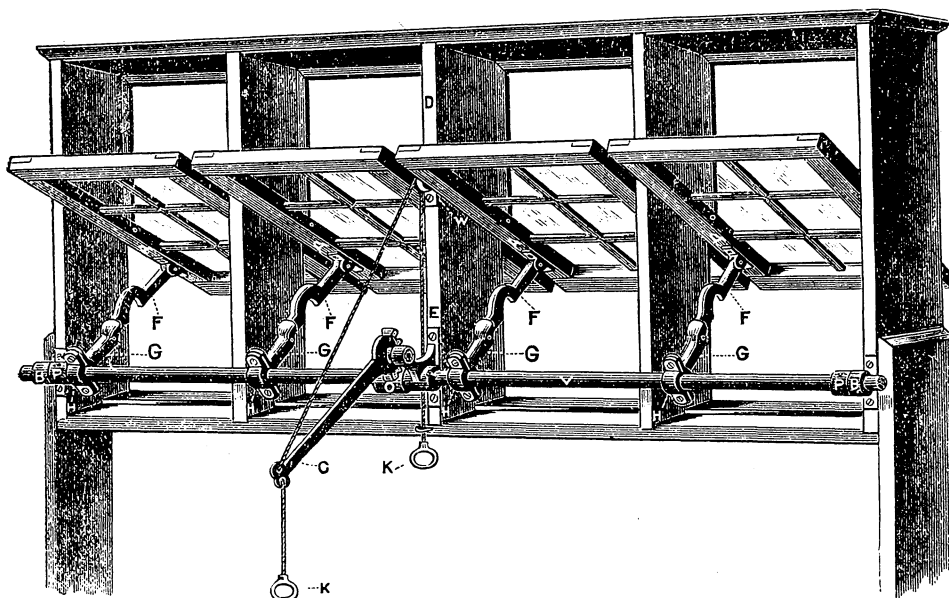
### Improved White Mountain Freezer.

The White Mountain Freezer Company, Nashua, N. H., and 105 Chambers street, New York, have introduced improvements in their freezers as presented herewith. The illustration is cut away to show the working parts inside the can. One of the improvements consists of a double self adjusting wood scraping bar, used in connection with the company's duplex dasher. The design

nothing can get between the cogs; cans full size, made of the best quality of charcoal tin plate; beaters of tinned malleable iron; all castings attached to the tub galvanized, and the triple motion which, it is stated, is peculiar to this freezer.

### The Sunbury Horse Poke.

A horse poke embodying special features is being introduced by H. L.

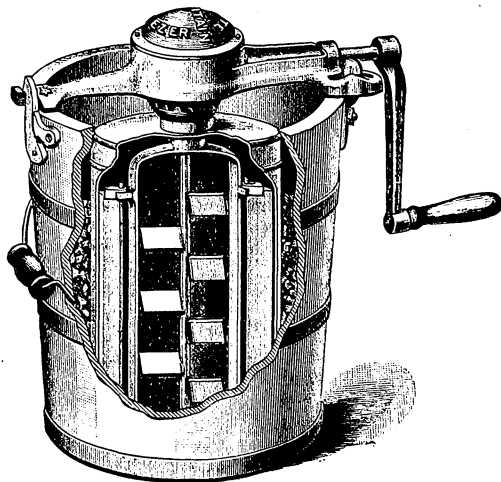


National Self Locking Ventilator Irons.

caps, H, and collars P. The sash arms are attached to sash and pipe; the operating arm C is attached to the studding and works in the clamp gear O on the pipe. The rope, of convenient length, with handles attached, runs over the pulley W, allowing the sash to be opened or closed either by hand or with a hook. The pipe journals B can be placed on every second piece of stud-

of this improved form of scraping bar is to decrease the time required for freezing cream, and the manufacturers claim that cream can now be frozen in four minutes. To obviate the quality of cream being impaired, which might result from reducing the time of freezing, a double set of floats are used on the inside of the beater rod, in place of a single set, as heretofore. The manu-

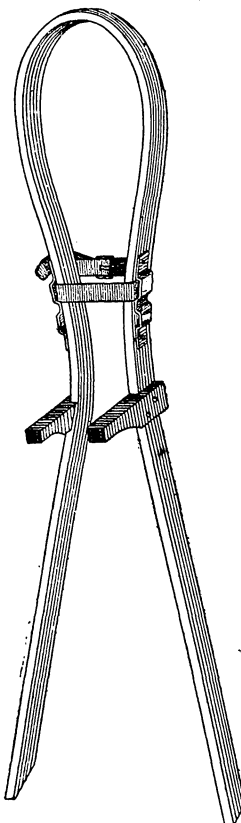
Wheaton & Brother, Sunbury, Ohio, a cut of which is here shown. It is described as being made of strictly sec-



Improved White Mountain Freezer.

ding, or about 6 to 8 feet apart. The irons are sold in sets complete, without pipe, usually for four sash. Pipe is furnished if desired, and extra parts may be obtained separately. Full directions for putting up the irons are supplied by the manufacturers to purchasers.

facturers state that this increases the agitating capacity of the beaters and that it produces fine, smooth cream. Other features of the freezer are referred to as follows: A strong water proof tub, bound with heavy galvanized iron hoops, which, it is claimed, do not fall off; gearing completely covered, so that



The Sunbury Horse Poke.

and growth ash, with no springs, joints or hinges and as having each bracket fastened with two bolts. The strap is



adjustable up or down by means of two loops and the poke can be made wide or narrow by means of the strap. The adjustability of the poke is referred to as an advantage, as the same poke can be made to fit large or small horses. It is pointed out that a horse is not in danger of hurting himself, as the brads in the brackets do not touch hard except when needed. The manufacturers claim that the poke will not only prevent a horse from jumping, but that it is a positive preventive against accident on account of barb wire; that there are no joints, hinges or springs to get out of repair; that a horse can eat with the poke on as well as with it off, and that it is easy to put on, requiring but little time.

#### Bridgeport Cyclometers.

The Bridgeport Gun Implement Company, 313-315 Broadway, New York, have made improvements in the cyclometer put upon the market by them

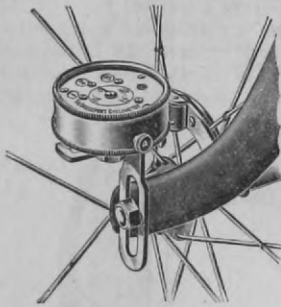


Fig. 1.—Cyclometer, Model A.

last year, and are now making it in three different styles, as shown in the accompanying cuts.

The cyclometer, Model A, shown in Fig. 1, is nickel finished, with a white celluloid face plate, enlarged figures on the dials and improved brackets and dogs. The meter is made for 28 and 30 inch wheels, weighs 6 ounces and registers 1000 miles and repeats, or can be set back to zero at will. Model B, Fig. 2, is the same as shown in Fig. 1, with the addition of a bell designed to

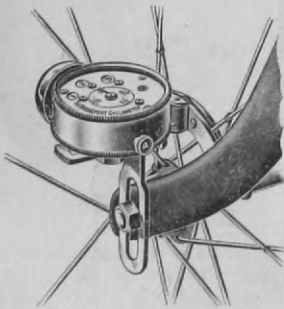


Fig. 2.—Cyclometer, Model B.

ring at every mile. The bell is referred to as a valuable addition for road riders who wish to know how fast they travel per mile. The meter is made for 28 and 30 inch wheels and weighs 7 ounces. The cyclometer shown in Fig. 3 registers, it is remarked, 10,000 miles accurately and repeats. The makers recommend Model C especially to wheelmen who take long trips or who enter for club mileage records; also to those who do not care to set the meter

back to zero. This is made for 28 and 30 inch wheels, and weighs 6½ ounces. The manufacturers guarantee the meters

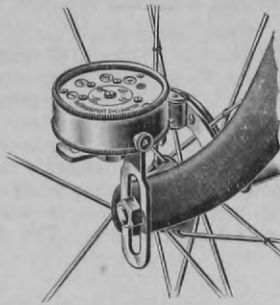
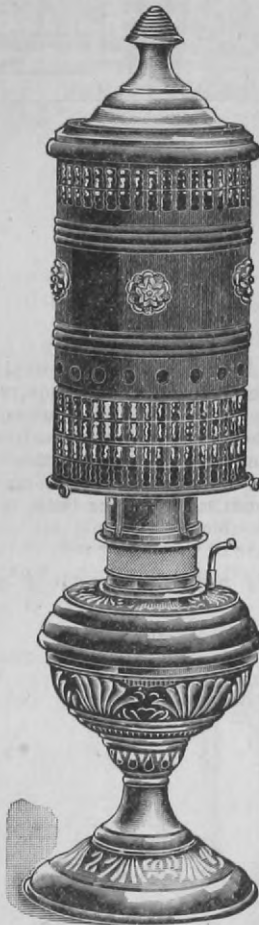


Fig. 3.—Cyclometer, Model C.

to be accurate, water proof and noiseless.

#### Brooklyn Lamp Radiator.

The cut here shown represents a lamp radiator, put on the market by Silver & Co., 304-310 Hewes street, Brooklyn, and 20 Warren street, New York. The



Brooklyn Lamp Radiator.

radiator is designed to be placed on a lamp after removing the glass chimney. The radiator is described as having an inside drum, which causes a forced draft of air to pass in and out between the cylinders, producing an active circulation of heated air. The top is of aluminum, removable for boiling water and for cooking purposes. Parlor lamp radiators are 14 inches high and 6 inches in diameter. For mammoth lamps the radiator is made 18 inches high and 7 inches in diameter. The manufacturers state that the radiators will comfortably heat a room 20 feet square in cold

weather, and that they are designed for use in dining rooms, offices and summer resorts, and wherever a moderate heat is required without flue connection.

#### Orange and Lemon Peeler.

Rogers & Bro., 16 Cortlandt street, New York, are marketing a simple device for removing the rind of an orange



Fig. 1.—Peeler, Table Size.



Fig. 2.—Peeler, Pocket Size.

or lemon, as shown in the accompanying cuts, Figs. 1 and 2 being actual size. In use the hook of the peeler is forced under the orange skin, when the fruit is revolved in the other hand and the peel cut into as many sections as desired, the flat face of the hook being about ⅜-inch wide. The blade is then inserted under the loose ends of the

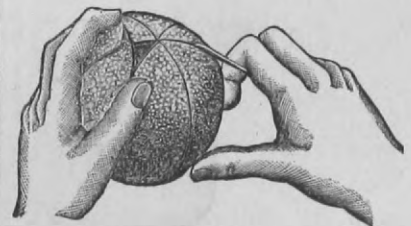


Fig. 3.—Method of Using.

sections and readily removed, together with the soft, white underskin. In Fig. 1 is seen the table size, Fig. 2 representing one made for pocket use. The latter are put up in neat leather sheaths or cases. They are made in plain, fluted and embossed patterns, either polished bright or in satin finish.

### P. & H. Lawn Sprinklers.

Plenger & Henger Mfg. Company, St. Louis, Mo., formerly the Eite & Henger Mfg. Company, are putting



Fig. 1.—Park Lawn Sprinkler.

lawn sprinklers on the market of which the accompanying cuts are representations. The Park Sprinkler, as shown

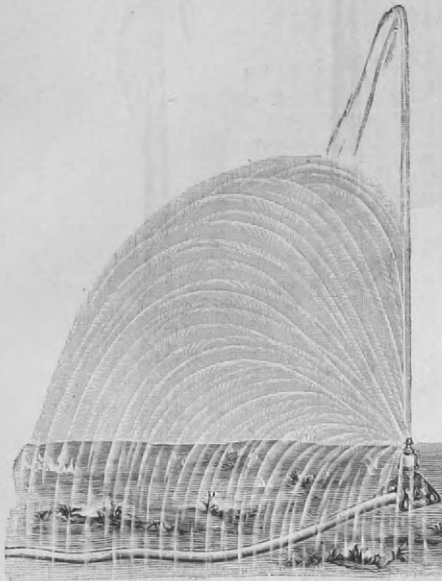


Fig. 2.—Half Circle Spray.

in Fig. 1, can be adjusted to throw a half or full circle spray, as in Figs. 2 and 3. It is remarked that the sprinkler has no revolving parts to leak

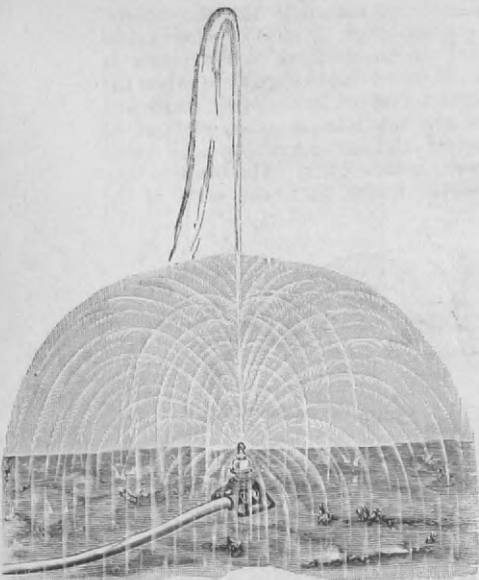


Fig. 3.—Full Circle Spray.

or to wear out; that it can be adjusted to throw a spray as light as steam or as heavy as the area of the supply pipe

will permit; that it has no small holes to clog, and that it can be moved about the lawn while in operation without turning off the water. The sprinkler shown in Fig. 4 has the top and arms

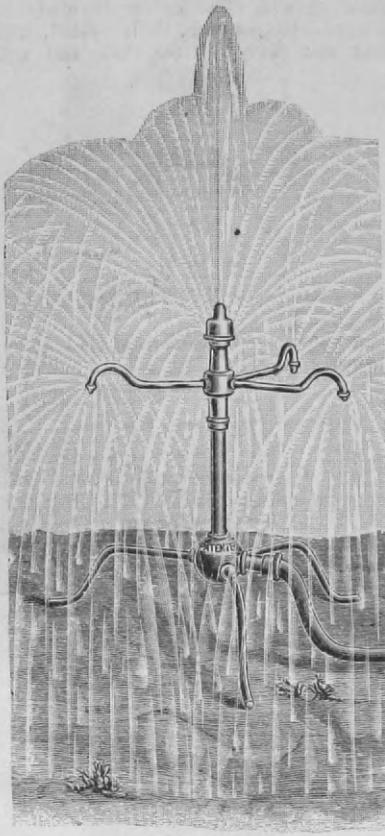
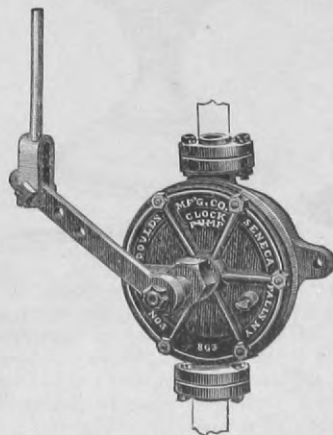


Fig. 4.—Imperial Combination Lawn Sprinkler.

made of brass, polished, with japanned standard and legs. It is explained that the sprinkler is a combination of their Japanese and Pacific sprinklers, making a fine effect, and that each one is guaranteed to give satisfaction. The sprinkler is made with three and four arms; and is also made with a high stand.

### Goulds Semi-Rotary Clock Force Pump

The cut here shown represents a semi-rotary clock force pump, put on the market by the Goulds Mfg. Company,



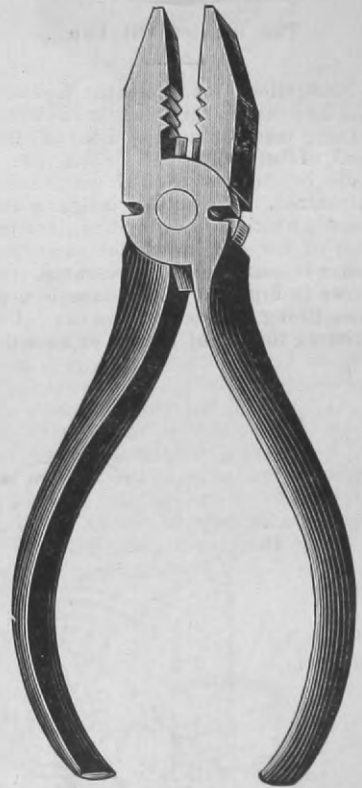
Goulds Semi-Rotary Clock Force Pump.

Seneca Falls, N. Y., and 16 Murray street, New York. The pump is provided with a removable lever and forked welding stub, for windmill or other

power connection. The working parts of the pump are described as comprising a brass double wing oscillating piston, with a brass valve on each side of the wing, incased in the cylinder. The lever, which, it is explained, may be worked from either a vertical or horizontal position, is attached to a shaft or piston rod, and the waterway of each set of valves is separated from the other in the suction valve box. It is stated that the pump is practically metallic fitted, and that having no leather packing it may be employed for pumping hot liquids, oil, wine, &c. In the brass fitted pump all working parts are brass, except the cylinder case and cover, while in the brass pump all the working parts are made of this metal.

### Combined Side Cutting and Burner Plier.

The Interchangeable Tool Company, Utica, N. Y., are manufacturing a useful combination plier, as here illustrated. It is known as Hall's side cutting burner plier No. 25. In this implement are included a side cutter and two joint cutters, the latter having a capacity of about  $\frac{3}{8}$  inch, together with a burner plier and common flat nose



Combination Plier.

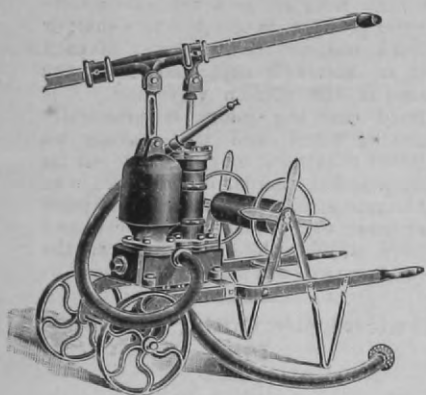
plier. The tool is 5 inches long and well made. It can be had either polished or nicked. It is being marketed by W. W. Pryor & Co., 81 Chambers street, New York, who carry this and other goods of this company in stock.

### Goulds Double Acting or Garden Fire Engine.

The Goulds Manufacturing Company, Seneca Falls, N. Y., and 16 Murray street, New York, are offering a double acting or garden fire engine, as shown in the accompanying cut. The engine is mounted on a wrought iron barrow with wheels, and is provided with a hose reel. The pump has a brass lined cylinder and rubber ball valves. It is



explained that four to six men can operate the engine to good effect, and that the reel will carry from 50 to 75 feet of 1½-inch three ply rubber hose.



*Goulds Double Acting or Garden Fire Engine.*

The engine is furnished with 6 feet of 2-inch spiral suction hose, 12 feet of 1½-inch discharge hose, a brass hose-pipe, sprinkler, hose coupling and suction basket.

#### The Wanted Oil Can.

Illustrations are presented herewith of a new oil can for domestic use which is being manufactured by Fred. F. Bischoff, Libertyville, Ill. The can is made of the best No. 27 gauge steel, galvanized. The outside is lightly embossed, which is done to strengthen the body of the can, and at the same time makes it handsome in appearance. As shown in Fig. 1, a rubber tube is used when filling a lamp from the can. Unscrewing the top of the can exposes the



*Fig. 1.—The Wanted Oil Can.*

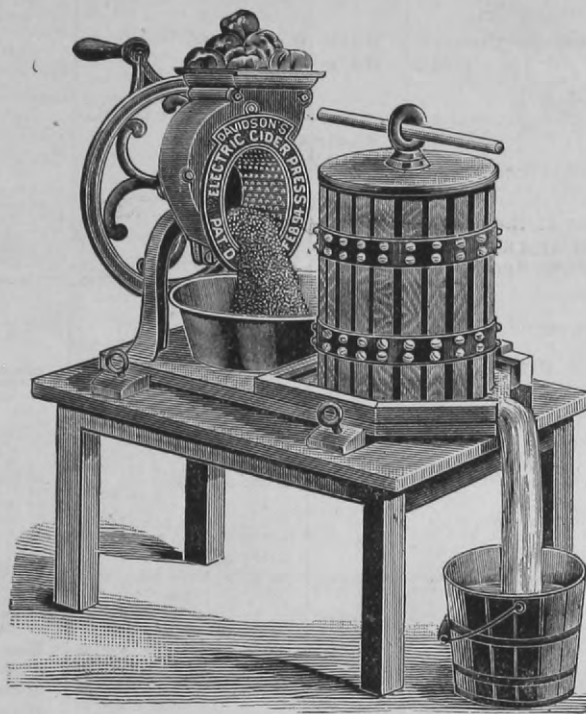
pump, as shown in Fig. 2. Special attention has been given to the pumping system, so that the can is capable of being used without any waste whatever. The weight of the pump is about 4½ pounds. The manufacturer claims for it durability, cheapness and economy.

ings are of gray iron covered with water proof varnish to prevent rust, and the other metal parts are of wrought iron. It is explained that the press cuts and peels the apples, separating the good from the bad, a feature, it is remarked, that is not essential in making cider, but in preparing fruit for

#### Davidson's Electric Cider Press.

O. E. Davidson & Co., Nashville, Tenn., are introducing a cider press, as here shown. The cutter is made of tinned steel, which, it is stated, will not wear except from rust, and will

cooking purposes is very convenient. It is further explained that the danger of the cider becoming blackened by metal rollers and hoppers is obviated by the construction of the cutter, which carries off the cut apple before it touches any part of the hopper or other metal from which it might be stained.



*Davidson's Electric Cider Press*

not rust if cleaned and kept in a dry place, while the board and crate are of well seasoned hardwood. The cast-

It is pointed out that as the press is small and convenient to carry, it is not likely to be left in the orchard to rust



*Fig. 2.—Use of Tube and Pump.*

or to rot, as may be the case with larger presses. The manufacturers state that the press is small, light, strong and low in price, and that while not designed to make cider for wholesale or in large quantities, it will be found sufficiently large for family use and well adapted to that purpose.

# Current Hardware Prices.

DECEMBER 26, 1894.

NOTE.—The quotations given below represent Current Hardware Prices, whether made by manufacturers or jobbers. They apply to such quantities of goods as are usually purchased by retail Hardware merchants. Very small orders and broken packages often command higher prices.

The character @ is used to indicate a range of price: thus discount 50 & 10% @ 50 & 10 & 5%, signifies that the goods in question are sold at prices ranging from 50 & 10% to 50 & 10 & 5%.

## Adjusters, Blind—

Domestic, # doz. \$8.00...39%  
Excelsior, # doz. \$10.00...50%  
North's...list net @ 10%  
Zimmerman's—See Fasteners, Blind.

**Ammunition**—See Caps, Cartridges, Shells, &c.

## Anvils—

**American—**  
Eagle Anvil, # doz. \$15.00...15%  
Horseshoe brand, Wrought...9%  
Barnes Mfg. Co...50%

**Imported—**  
Armitage's Mouse Hole...8%  
S. & H. machine finished...9%  
Trenton...9%  
Peter Wright's...9%

**Anvil, Vise and Drill—**  
Allen Anvil and Vise, \$3.00...40%  
Cheney Anvil and Vise...25%  
Millers Falls Co., \$18.00...20%  
Holt's...40%

**Apple Parers**—See Parers, Apple, &c.

**Augers and Bits—**

Common Augers and Bits, 70 & 100...75%  
Boring Machine Augers...70%  
Car Bits, 12-in. twist...50%  
Cincinnati Bell-Hangers' Bits...40%  
Forstner Pat. Auger Bits...25%  
Jennings' Pattern Car Bits...40%  
Jennings' Pattern Auger Bits...60%  
C. E. Jennings & Co., No. 10 extension...40%  
C. E. Jennings & Co., No. 30...40%  
C. E. Jennings & Co., Auger Bits, # set...32%  
Russell Jennings' Augers and Bits...25%  
Lewis' Patent Single twist...45%  
L'Hommedieu Car Bits...15%  
Pugh's Black...30%  
Pugh's Jennings Pattern...30%  
Snell's Bits...60%

**Bit Stock Drills—**

Cleveland...50%  
Morse Twist Drills...50%  
New Process Twist Drill Co...60%  
Standard...40%  
Syracuse, for metal...40%  
Cincinnati, for wood...40%  
Cincinnati, for metal...50%  
Syracuse, for wood (wood list)...30%

**Expansive Bits—**

Clark's small, #18; large, #26...40%  
Ives' No. 4, # doz. \$60...40%  
Steer's No. 1, #26; No. 2, 18...40%  
Stearns' No. 2, #48...20%  
Swan's...40%

**Gimlet Bits—**

Bee...25%  
Common...25%  
Diamond, # doz. \$1.25...40%  
Double Cut...40%  
Hartwell's, # gr. \$10.00...40%  
Douglass...40%  
Ives...60%  
Shepardson's...45%

**Hollow Augers—**

Bonney's Adjustable...# doz. \$21.00  
Cincinnati Adjustable...25%  
Cincinnati Standard...25%  
Douglass...33%  
French, Swift & Co. (Beecher)...33%  
Ives' Expansive, each, \$4.50...50%  
Stearns' Universal Expansive, each \$4.50...20%  
Wood's, # doz. \$48...25%

**Ship Augers and Bits—**

L'Hommedieu's...15%  
Snell's...25%  
Snell's Ship Auger Pat'n Car Bits...15%  
Watrous'...25%

**Awl Hafts**—See Hafts, Awl.

**Awls—**

Brad, Handled...# gr. \$2.50@3.00  
Brad, Shouldered...# gr. \$1.30@1.40  
Peg, Pat...# gr. 35¢@38¢  
Peg, Should...# gr. \$1.50@1.55  
Scratch, Handled...# gr. \$4.00@4.50  
Scratch, Socket...# doz. \$1.10@1.20

**Awl and Tool Sets**—See Sets, Awl and Tool.

**Axes—**

First quality, best brands...\$5.50@6.00  
First quality, other brands...\$5.00@5.50  
Beveled, add 50¢ # doz.

**Axle Grease**—See Grease, Axle.

**Axles—**

No. 1 Common...3¢  
No. 2 Common...3¢  
Nos. 7 to 14...7¢  
Nos. 15 to 18...17¢  
Nos. 16 to 22...70¢  
Concord, loose collar...44¢  
Concord, solid collar...49¢

**Bag Holders**—See Holders, Bag.

**Balances—**

**Sash—**  
Caldwell, low list...80%  
Pullman...60%  
Sensible...100%

**Spring—**  
Spring Balances...40%  
No. 2000...30%  
Chattillon, # doz...\$0.80 .95 1.75 net  
Chattillon Straight Balances...40%  
Chattillon Circular Balances...50%

**Barb Wire**—See Wire, Barb.

**Bars—**

**Crow—**  
Cast Steel...# doz. 2 1/2¢@3¢  
Iron, Steel Points...# doz. 2 1/2¢@2 3/4¢

**Basins, Wash—**

Standard Fiberware, No. 1, 10 1/2 in., \$1.80;  
12-inch, \$2.00; 13 1/2 in., \$2.50.

**Beams, Scale—**

Chattillon's No. 1...40%  
Chattillon's No. 2...50%  
Custers', doz. lots...33%

**Beaters—**

**Egg—**  
Bryant's...# gr. \$14.00  
Double (H. & R. Mfg. Co.)...# gr. No. 0, \$12.00; No. 1, \$15.00; No. 2, \$36.00.  
Dover...# doz. \$1.00; # gr. \$10.50  
Dover, Ex. Family size...# doz. \$3.50  
Dover (Standard Co.)...# doz. \$1.00  
Duplex (Standard Co.)...# doz. \$1.00  
Duplex Extra Heavy (Standard Co.)...# doz. \$3.50  
Easy (H. & R. Mfg. Co.)...# gr. \$2.00  
Improved Acme (H. & R. Mfg. Co.)...# gr. \$9.00  
Silver & Co...# doz. \$4.50  
Spiral...# gr. \$4.25@4.50  
Triple (H. & R. Mfg. Co.)...# gr. \$16.50

**Culinary—**

Keystone, P. D. & Co., Each, No. 1, \$1;  
No. 2, \$2...20%

**Bells—**

**Cow—**  
Common Wrought...60%  
Kentucky Durrham...70%  
Kentucky, Sargent's list...70%  
Kentucky "Star"...20%  
Texas Star...50%  
Western, Sargent's list...70%

**Door—**

Crank, Brooks'...50%  
Crank, Cone's...10%  
Crank, Connel's...20%  
Gong, Abbe's...33%  
Gong, Barton's...40%  
Gong, Yankee...45%  
Lever, R. & E. Mfg. Co.'s...50%  
Lever, Sargent's...60%  
Lever, Taylor's Bronzed or Plated...net  
Lever, Taylor's Japanned...25%  
Pull, Brooks'...50%

**Electric—**

Bigelow & Dowse...40%  
Wollensak's...40%

**Hand—**

Extra Heavy Brass...70%  
Light Brass...70%  
Super Chime...33%  
White...70%  
Globe (Cone's Patent)...25%

**Miscellaneous—**

Call...50%  
Farm Bells...# doz. 2 1/2¢  
Steel Alloy Church and School Bells...50%

**Bellows—**

Blacksmiths'...70%  
Hand Bellows...50%  
Molders'...50%

**Beiting, Rubber—**

Common Standard...75%  
Extra...60%  
N. Y. B. & P. Co., Carbon...70%  
N. Y. B. & P. Co., Diamond...60%  
N. Y. B. & P. Co., 1846 Para...40%

**Bench Stops**—See Stops, Bench

**Benders and Upsetters, Tire—**

Brettell Tire Upsetter, \$15...45%  
Detroit Perfected Tire Bender...15%  
Green River Tire Benders and Upsetters...20%  
Stoddard's Lightning Tire Upsetters...15%

**Bits—**

Auger, Gimlet, Bit Stock Drills, &c., see Augers and Bits.

**Bit Holders**—See Holders.

**Blind Adjusters**—See Adjusters, Blind.

**Blind Fasteners**—See Fasteners, Blind.

**Blind Staples**—See Staples, Blind.

**Blocks—**

Cleveland Block Co., Mal. Iron...50%  
Moore's Novelty, Mal. Iron...60%  
Sure Grip Steel Tackle Blocks...25%  
See also Machines, Hoisting.

**Bolts—**

**Carriage, Machine, &c.—**  
Com., list June 10, '84...80%

Genuine Eagle, Norway, list Oct. '84...80%  
Eagle, Norway, list Oct., '84...80%

**Phil. pattern, list Oct. '74...80%**

R. B. & W., old list...70%  
Bolt Ends, list Jan. 1, '90...80%  
Machine, list Jan. 1, '90...80%

**Door and Shutter—**

Cast Iron Barrel, Square, &c...75%  
Cast Iron Chain (Sargent's list)...65%  
Cast Iron Shutter Bolts...75%  
Ives Patent Door...60%  
Wrought Barrel...75%  
Wrt B. K. Flush Common...60%  
Wrt Shutter, Brass Knob...50%  
Wrt Shutter, Sargent's list...60%  
Key Shutter, all Iron, Stanley's list...60%  
Wrought Square...75%  
Wrt Sunk Flush, Sargent's list...60%  
Wrt Sunk Flush, Stanley's list...60%

**Stove and Plow—**

Plow...60%  
Stove...70%  
R. B. & W. Plow...55%

**Tire—**

Common, list Feb. 28, '83...70%  
American Screw Company:  
Norway, Phila., list Oct. 16, '84...75%  
Eagle, Phila., list Oct. 16, '84...80%  
Keystone, Phila., list Oct. 16, '84...70%  
Franklin Moore Co.:  
Norway, Phila., list Oct. 16, '84...75%  
Eagle, Phila., list Oct. 16, '84...80%  
Eclipse, list Feb. 28, '83...70%  
Port Chester Bolt & Nut Company:  
Empire, list Feb. 28, '83...70%  
Key State, list Feb. 28, '83...80%  
Norway, Phila., list Oct. 16, '84...75%  
R. B. & W., Phila., list Oct. 16, '84...85%

**Borers, Tap—**

Common and Ring...20%  
Clark's...33%  
Enterprise Mfg. Co...25%  
Ives' Tap Borers...33%

**Boring Machines**—See Machines, Boring.

**Bow Pins**—See Pins, Bow.

**Boxes, Letter—**

Tatum's...40%

**Boxes, Wagon—**

Per lb...23¢

**Boxes, Miter—**

Spilker's Excelsior, 3-in., \$7.50; 4-in., \$8.50; 5-in., \$13.00; 6-in., \$15.00...20%

**Braces—**

NOTE.—Most Braces are sold at net prices.  
Barber's...50%  
Armstrong's...50%  
Common Ball, American...\$1.00@1.10  
Davis Patent...50%  
Fray's Genuine Spofford's...50%  
Fray's Nos. 7 to 12, \$1 to 123, 207 to 414...50%  
Ives' New Haven Novelty...70%  
New Haven Ratchet...60%  
Barber Ratchet...60%  
Barber's...60%  
Spofford...60%  
P. W. Co., Peck's Patent...50%  
Rose & Johnson...50%

**Brackets—**

Shelf, fancy:  
Sargent's list...70%  
Other makes at a wide range of prices.  
Shelf, plain:  
Regular, list...65%  
Sargent's list...60%  
Bradley Shelf Brackets...75%

**Bright Wire Goods**—See Wire.

**Broilers—**

Hen's Self...9 10 9x11  
Basting...# Per doz. \$4.50 5.50 6.50  
Morgan Odorless, # doz...\$12...50%  
New Haven...50%  
Wire Goods Co...65%

**Buckets, Well and Fire—**

See Pails.

**Bucks, Saw—**

Hoosier...# gr. \$27.00

**Bull Rings**—See Rings, Bull.

**Butchers' Cleavers**—See Cleavers, Butchers'.

**Butts—**

Cast Brass, Fast...33%  
Cast Brass, Loose Joint...33%  
Cast Brass, Tiebout's...50%  
Wrought Brass...80%

**Cast Iron—**

Fast Joint, Broad...60%  
Fast Joint, Narrow...60%  
Loose Joint...60%  
Loose Joint, Jap. with Acornus...75%  
Loose Pin, Acornus...80%  
Loose Pin, Acornus, Japanned...75%  
Loose Pin, Acornus, Japanned, Plated Tips...80%  
Mayer's Hinges...75%  
Parliament Butts...75%

**Wrought Steel—**

Fast Joint, Broad...60%  
Fast Joint, Narrow...60%  
Fast Joint, Lt. Narrow...60%  
Inside Blind, Light...60%  
Inside Blind, Regular...60%  
Loose Joint, Broad...60%  
Loose Pin...60%

**Table Butts, Back Flaps &c.**

Fast Joint, Broad...60%  
Fast Joint, Narrow...60%  
Fast Joint, Lt. Narrow...60%  
Inside Blind, Light...60%  
Inside Blind, Regular...60%  
Loose Joint, Broad...60%  
Loose Pin...60%

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Fast Joint, Narrow...60%  
Fast Joint, Lt. Narrow...60%  
Inside Blind, Light...60%  
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Fast Joint, Narrow...60%  
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Inside Blind, Light...60%  
Inside Blind, Regular...60%  
Loose Joint, Broad...60%  
Loose Pin...60%

Fast Joint, Broad...60%  
Fast Joint, Narrow...60%  
Fast Joint, Lt. Narrow...60%  
Inside Blind, Light...60%  
Inside Blind, Regular...60%  
Loose Joint, Broad...60%  
Loose Pin...60%

Bronzed Wrought Butts...50%

**Cages, Bird—**

Hendryx, Brass:  
3000, 5000, 1100 series...10%  
1200 series...40%  
200, 300, 600 and 900 series...40%  
Hendryx Bronze:  
700, 800 series...40%  
Hendryx Enamelled...40%

**Calipers**—See Compasses.

**Calks, Toe—**

Burke's, One Prong, Blunt...4%  
Burke's, One Prong, Sharp...5%  
Burke's Two Prong, Blunt...5%  
Burke's Two Prong, Sharp...5%  
Gautier, One Prong, Blunt...5%

**Can Openers**—See Openers, Can.

**Cans, Milk—**

S. S. & Co.: 5-gal., \$3.00; 8-gal., \$4.40;  
10-gal., \$4.75 each...40%

**Cans, Oil—**

Galvanized Blue Band, 1-gal., # doz. \$2.25  
Galvanized Blue Band, 5-gal., Tip-Top, # doz. \$12.00  
Galvanized Blue Band, 5-gal., Faucet, # doz. \$8.00  
Glass Oil, Friend...# doz. \$2.75

**Caps—**

**Percussion—**  
Eley's E. B...52%  
Hicks & Goldmark's and Union Metallic Cartridge Co...100%  
E. B. Grnd. Edge, Cent. Fire, 1-10's...47%  
E. B. Trimmed Edge, 1-10's...47%  
F. L. Waterproof, 1-10's...35%  
G. D...35%  
Musket, Waterproof, 1-10's...50%  
S. B. Genuine Imported...45%

**Primers—**

Berdan Primers, \$1.00...2%  
B. L. Caps (Sturtevant Shells) \$1.00...2%  
All other primers, \$1.20...2%

**Cards—**

Watson's Cotton, Wool, Horse and File, list January 28, '91...10%

**Carpet Stretchers—**

See Stretchers, Carpet.

**Cartridges—**

B. B. Caps, Con. Ball, Swgd...\$1.85@1.90  
B. B. Caps, Round Ball...\$1.60@1.65  
Blank Cartridges, except 22 and 32 cal. additional 10% to above discounts.  
Blank Cartridges, 22 cal., \$1.75...2%  
Blank Cartridges, 32 cal., \$3.50...2%  
Cent. Fire, Military and Sporting...15%

**Carpet Sweepers—**

See Sweepers, Carpet.

**Cash Registers—**

See Registers, Cash.

**Casters—**

Bed...60%  
Plate...60%  
Shallow Socket...60%  
Deep Socket...60%  
Giant Truck Casters...35%  
Gwinner's Common Sense...50%  
Gwinner's Hercules...45%  
Martin's Patent (Phoenix)...45%  
Payson's Anti-friction...70%  
Payson's Truck...60%  
Socket Truck Casters...50%  
Stationary Truck Casters...50%  
Tatum's Truck...60%  
Trucker's Patent, low list...50%  
Yale Casters, low list...45%  
Yale, Gem...70%

**Cattle Leaders—**

See Leaders, Cattle.

**Cement—**

Victor Elastic...5 m pails, # m 5¢  
**Chain—**  
American Coll. in cask lots:  
3.16 3 1/4 5.16 3 1/2 7.16 3 3/4 9.16 3 1/2 11.16 3 1/2 13.16 3 1/2 15.16 3 1/2 17.16 3 1/2 19.16 3 1/2 21.16 3 1/2 23.16 3 1/2 25.16 3 1/2 27.16 3 1/2 29.16 3 1/2 31.16 3 1/2 33.16 3 1/2 35.16 3 1/2 37.16 3 1/2 39.16 3 1/2 41.16 3 1/2 43.16 3 1/2 45.16 3 1/2 47.16 3 1/2 49.16 3 1/2 51.16 3 1/2 53.16 3 1/2 55.16 3 1/2 57.16 3 1/2 59.16 3 1/2 61.16 3 1/2 63.16 3 1/2 65.16 3 1/2 67.16 3 1/2 69.16 3 1/2 71.16 3 1/2 73.16 3 1/2 75.16 3 1/2 77.16 3 1/2 79.16 3 1/2 81.16 3 1/2 83.16 3 1/2 85.16 3 1/2 87.16 3 1/2 89.16 3 1/2 91.16 3 1/2 93.16 3 1/2 95.16 3 1/2 97.16 3 1/2 99.16 3 1/2 101.16 3 1/2 103.16 3 1/2 105.16 3 1/2 107.16 3 1/2 109.16 3 1/2 111.16 3 1/2 113.16 3 1/2 115.16 3 1/2 117.16 3 1/2 119.16 3 1/2 121.16 3 1/2 123.16 3 1/2 125.16 3 1/2 127.16 3 1/2 129.16 3 1/2 131.16 3 1/2 133.16 3 1/2 135.16 3 1/2 137.16 3 1/2 139.16 3 1/2 141.16 3 1/2 143.16 3 1/2 145.16 3 1/2 147.16 3 1/2 149.16 3 1/2 151.16 3 1/2 153.16 3 1/2 155.16 3 1/2 157.16 3 1/2 159.16 3 1/2 161.16 3 1/2 163.16 3 1/2 165.16 3 1/2 167.16 3 1/2 169.16 3 1/2 171.16 3 1/2 173.16 3 1/2 175.16 3

**Chisels—**  
Socket Framing and Firmer  
Mix.  
Ohio Tool Co. 80@80&5%  
P. S. & W.  
Wetherby  
Buck Bros. 30%  
Charles Buck. 75@75&10%  
Douglass. 60&10@60&10&10%  
Merrill. 30@30&5%  
L. & J. White. 30@30&5%  
**Tanged and Miscellaneous.**  
Buck Bros. 30%  
Charles Buck. 30%  
Douglass. 75@75&10%  
Merrill. 60&10@60&10&10%  
L. & J. White. 30@30&5%  
**Cracks, Nut—**  
A. J. White, Tanged. 25&5%  
Cold Chisels, fair quality. 14@16%  
**Chucks—**  
Beach Pat., each \$8.00. 20%  
Danbury, each \$6.00. 30@30&5%  
Gay & Patons. 39%  
Morse's Adjustable, each \$7.00. 20@20&5%  
Syracuse, Balz Pat. 25%  
Skinner Patent Chucks:  
Combination Lathe Chucks. 40%  
Drill Chucks. 25%  
Independent Lathe Chucks. 25%  
Planer Chucks. 40%  
Universal Lathe Chucks. 40%  
Union Mfg. Co.:  
Combination. 40%  
Independent. 40%  
Universal. 40%  
Victor. \$8.50. 25%  
**Churns—**  
McDermid Star Barrel Churn, each  
6-gal. \$2.60; 10-gal. \$2.75; 15-gal.  
\$3.00; 20-gal. \$3.25.  
Timin Union, each 5-gal. \$3.25; 7-gal.  
\$3.75; 10-gal. \$4.25.  
**Clamps**  
Adjustable Cincinnati. 25&10%  
Adjustable, Stearns'. 30@30&10%  
Barnes' Malleable Screw and Cabinet. 50%  
Barnes' Machinists' Clamps. 39%  
Cabinet, Sargent's. 70&10%  
Carpenters' Cincinnati. 25&10%  
Carriage Makers', P. S. & W. Co. 40&10%  
Carriage Makers' Sargent's. 75@75&10%  
Eberhard Mfg. Co. 40&10%  
Joiners' Clamps, Tatum's. 25&10%  
R. I. Tool Co.'s Wrought Iron. 25%  
Saw Clamps, see *Vises, Saw Filers*.  
Stearns' Malleable, with Wrought Iron  
Screw. 75@75&5%  
Stearns' Steel. 39%  
Warner's. 40&10@40&10&5%  
**Cleavers, Butchers'—**  
Beatty's. 40&5@40&10%  
Bradley's. 25@30%  
Foster Bros. 30%  
New Haven Edge Tool Co.'s. 40%  
Nichols Bros. 30%  
P. S. & W. 39%  
Schulte, Lohoff & Co. 40&10%  
L. & J. White. 25%  
**Clips—**  
Baker Axle Clips. 25&10%  
Norway Axle. 70@70&5%  
Norway Spring Bar Clips. 60&10@70&10%  
2d grade Norway Axle. 70&5@70&10%  
Steel Felloe Clips. 70@70&5%  
Superior Axle Clips. 70@70&5%  
Wrought Iron Felloe Clips. 44@44%  
**Cloth and Netting, Wire**  
—See *Wire, &c.*  
**Cockeyes.** 50%  
**Cocks, Brass—**  
Hardware list (Globe, Kerosene, Lever  
Bibbs, Racking, &c.). 60&10&10&2%  
**Coffee Mills—**See *Mills, Coffee.*  
**Collars, Dog—**  
Brass, Pope & Stevens' list. 40%  
Chapman Mfg. Company, new list. 40%  
Embossed Gilt, Pope & Stevens' list. 30&10%  
Leather, Pope & Stevens' list. 40%  
Medford Pancy Goods Co. 40&10@50%  
**Combs, Curry—**  
American Curry Comb Co. 39%  
Fitch's. 50&10@50&10&10%  
Gibbs' Magnifying. 80%  
Kohler's Humane. 30%  
Mohler's Magic Oscillating. 20%  
Rubber, 30%  
Rubber, 20%  
**Compasses, Dividers, &c.**  
Compasses, Callipers, Dividers, 70&10@75%  
Bemis & Call Co.'s:  
Dividers. 65%  
Callipers, Call's Patent Inside. 55%  
Callipers, Double. 85%  
Callipers, Inside or outside. 85%  
Callipers, Wing. 80%  
Compasses. 50&5%  
Excelsior. 50%  
Starrett's:  
Combination Dividers. 25%  
Lock Callipers and Dividers. 25%  
Spring Callipers and Dividers. 25%  
Stevens & Co's. 25&10%  
**Coolers Water—**  
S. S. & Co. 2-gal. \$3.40; 3-gal. \$4.00;  
4-gal. \$4.50; 6-gal. \$5.00 each. 60%  
**Coopers' Tools—**  
See *Tools, Coopers*.  
**Cord—**  
Braided, Crown Drab and Fancy, 30%  
Braided, Crown White, 50%  
Cable Laid Italian Sash. 19@20%  
Common. 80%  
Common Russia Sash. 12@13%  
Egyptian, India Hemp, Braided. 26%  
India Cable Laid Sash. 11@12%  
Massachusetts, White. 21@22%  
Ossawaun Mills.  
Crown, Solid Braided White. 29%  
Crown, Drab and Fancy. 29%  
Braided Gilt, Drab and Fancy. 30%  
Braided, Gilt, White. 20%  
Patent, good quality. 10@11%  
Patent Russia Sash. 13@14%  
Samson:  
Braided, Drab Cotton. 42%  
Braided, Italian Hemp. 40%  
Braided, Linen. 50%  
Braided, White Cotton. 37%  
Semper Idem, Braided, White. 26%  
Silver Lake:  
A quality, Drab, 55%  
A quality, White, 50%  
B quality, Drab, 35%  
B quality, White, 30%  
Sylvan Spring, Extra Braided, Drab. 39%  
Sylvan Spring, Extra Braided White. 34%  
Tate's Solid Braided:  
Economy, Drab. 27%  
Economy, White. 22%

Hercules, Drab. 30%  
Hercules, White. 25%  
White Cotton Braided, fair. 23@24%  
**Wire Picture—**  
Braided or Twisted. 80&10@80&20%  
**Corkscrews—**See *Screws, Cork.*  
**Corn Knives and Cutters**  
—See *Knives, Corn.*  
**Crackers, Nut—**  
A. J. White, gr. \$30. 50%  
Nickel Plated, gr. \$30. 30%  
Fancy Nickel Plated, gr. \$30. 40%  
Table (H. & B. Mfg. Co.). 50%  
Turner & Seymour Mfg. Co. 50%  
**Cradles—**  
Grain. 50&2@50&5&2%  
**Crayons**  
White Crayons, gross. 6@6%  
Cases, 100 gr. \$3.75@4.25, at factory.  
D. M. Stewart Mfg. Co.  
Metal Workers', gr. \$2.50. 20@25%  
Railroad, gr. \$2.00. 20@25%  
Rolling Mill, gr. \$2.50. 20@25%  
Soapstone Pencils, gr. 1.50. 20@25%  
See also *Chalk*.  
**Creamery Pails—**See *Pails, Creamery.*  
**Crow Bars—**See *Bars, Crow.*  
**Curr Combs**  
—See *Combs, Curry.*  
**Cutters—**Meat—  
American:  
Nos. 1, 2, 3, 4, B 30%  
Each \$5 \$7 \$10 \$25 \$50 \$80  
Enterprise. 25%  
Nos. 10, 12, 22, 32, 42  
Each \$3 \$2.50 \$4 \$6 \$15  
Dixon's, 4 doz. 40@40&5%  
Nos. 1, 2, 3, 4, B 30%  
Each \$14.00 \$17.00 \$19.00 \$30.00  
Draw Cut, each:  
Nos. 5, 2, 6, 8 20@25%  
Hale's, 5 doz. 70@70&5%  
Nos. 1, 2, 3, 4, B 30%  
Each \$27.00 \$33.00 \$45.00  
Home No. 1, 3 doz. \$28.00. 55&10%  
Little Giant, 3 doz. 50@50&5%  
Nos. 305, 310, 312, 320, 322  
\$35.00 \$48.00 \$44.00 \$72.00 \$68.00  
Miles' Challenge, 3 doz. 45@45&10%  
Nos. 1, 2, 3, 4, B 30%  
Each \$22.00 \$30.00 \$40.00  
Triumph No. 505, 3 doz. \$21.00. 25@30%  
Woodruff's, 3 doz. 40@40&5%  
Nos. 1, 2, 3, 4, B 30%  
Each 100 150  
Chadborn's Smoked Beef Cutter, 3 doz. \$80.00  
Enterprise Beef Shavers. 20%  
**Slaw and Kraut—**  
Tucker & Dorsey Mfg. Co.:  
Kraut Cutters. 40%  
Slaw Cutters, 1 Knife, gr. \$21.00  
Slaw Cutters, 2 Knife, gr. \$30.00  
**Tobacco**  
A. J. White, 3 doz. \$20.00. 40%  
All Iron. 40%  
Champion. 20@20&10%  
Nassau Lock Co.'s, 3 doz. \$18.00. 50&5%  
National, 3 doz. \$21.00. 30%  
Sargent's, 3 doz. \$24.00. 60&60&10%  
**Washer—**  
Appleton's, 3 doz. \$18.00. 60&10@60&10&10%  
Bonney's, 3 doz. \$8.50. 50@50&5%  
Cincinnati. 25&10%  
Johnson's, Wm., 3 doz. \$11.00. 50%  
Penny's, 3 doz. \$14. 30%  
Smith's Pat., 3 doz. \$12.00. 20&10&10%  
Tatum's. 25&10%  
**Diggers, Post Hole, &c.—**  
Eureka Diggers. 30%  
Fletcher Post Hole Augers. 30%  
\$36.00. 20@20&10%  
Gem, Improved. 30%  
Gibbs' Columbia. 30%  
Gibbs' Hustler. 30%  
Gibbs' Imperial. 30%  
Gibbs' National. 30%  
Gibbs' Post Hole Digger. 30%  
Kohler's Hercules. 30%  
Kohler's Invincible. 30%  
Kohler's Little Giant. 30%  
Kohler's Champion. 30%  
Kohler's Pioneer. 30%  
Sampson, 3 doz. \$34.00. 25@25&10%  
Universal. 30%  
Shimer's Hollow Handle. 30%  
Vaughan's Post Hole Auger. 30%  
\$8.50@9.50  
**Dividers—**See *Compass.*  
**Dog Collars—**See *Collars, Dog.*  
**Door Checks—**  
See *Checks, Door.*  
**Door Springs—**  
See *Springs, Door.*  
**Drawers, Money—**  
Money Drawers. 30%  
Mordford. 30%  
Pat. Alarm Till, Tucker's No. 1. 30%  
Pat. Alarm Till, Tucker's No. 2. 30%  
Pat. Alarm Till, Tucker's No. 3. 30%  
Waddell's Improved, No. 1. 30%  
Waddell's Improved, No. 2. 30%  
Waddell's Comb, Cutlery Case and  
Alarm Till. \$12.50  
**Drawing Knives—**  
See *Knives, Drawing.*  
**Drills and Drill Stocks—**  
Automatic Boring Tools. \$1.75@1.85  
Bench Drills, Stearns'. 50%  
Blacksmiths' Self-feeding. 30%  
Breast, Bartholomew's, No. 12, 30%  
Breast, Millers Falls, each \$3.00. 25%  
Breast, P. S. & W. 40&10%  
Breast, Wilson's. 30&5%  
Chicopee Automatic Drill. 20&10%  
Goodell Automatic Drills. 40&5@40&10%  
Ratchet, Curtis & Curtis. 25%  
Ratchet, Ingalls'. 25%  
Ratchet, Merrill's. 20@20&5%  
Ratchet, Moore's Triple Action. 25@30%  
Ratchet, Parker's. 20@20&5%  
Ratchet, Weston's. 20@25%  
Ratchet, Whitney's. 20&10%  
Whitney's Hand Drill, Plain, \$11.00  
Adjustable. \$12.00. 20&10%  
**Twist Drills—**  
Cleveland. 50&10%  
Diamond, W. & B. 50&60  
Graham's Pat. Groove Shank. 10%  
Morse. 10%

New Process. 50&10&5  
Standard. 60&60&5  
Syracuse (Metallist). 60&60&5  
**Drill Bits or Bit Stock**  
Drills—See *Augers and Bits.*  
Drill Chucks—See *Chucks.*  
Dripping Pans—  
See *Pans, Dripping.*  
Drivers, Screw—  
Allard's Spiral. 50%  
Brace Screw Drivers. 25&10%  
Buck Bros. 30%  
Buck Bros' Screw Driver Bits. 27%  
Clark's Pat. 33%  
Cincinnati. 25&10%  
Champion. 25&10%  
Dixson's. 50&60&10%  
Douglass Mfg. Co. 20@20&10%  
Electric Spiral. 50%  
Ellrich's Socket and Ratchet. 40&10%  
Fray's Hol. Hole Sets, No. 3, \$12.00. 45%  
Gay & Patons. 70&10%  
Goodell's Automatic. 50&50&5%  
Howard-Allard. 50%  
Jones Reversible. 40%  
Knapp & Cowles:  
No. 1. 70&10%  
No. 2. 70&10%  
No. 3. 60&10%  
Nos. 4 and 10, Acme and Ideal. 60&10%  
Kolb's Common Sense, 3 doz. \$3.00. 25&10%  
Mayhew's Black Handle. 50%  
Mayhew's Monarch. 45&10%  
New York, Manhattan and Handy. 70%  
P. S. & W.  
Sargent & Co.'s:  
No. 1, Forged Blade. 60&10&10%  
Nos. 20, 40 and 60. 60&10&10%  
Screw Driver Bits, Parr's. 30%  
Screw Driver Bits, 3 doz. \$6.25  
Stanley's R. & L. 50&75%  
No. 64, Varnished Handles. 65&10%  
No. 86. 70&10%  
Stearns'. 25&10&5%  
Syracuse Screw Driver Bits. 30@30&5%  
C. T. Williamson Wire Noddy Co. 50%  
**Egg Beaters—**See *Beaters, Egg.*  
**Egg Poachers—**  
See *Poachers, Egg.*  
**Electric Bell Sets—**  
See *Bells, Electric.*  
**Emery—**No. 4 to No. 54 to Flour, CF  
46 gr. 150 gr. F.F.F.  
Kegs, 3 lb. 4 1/2 c. 5 c. 3 c.  
1/2 kegs, 3 lb. 4 1/2 c. 5 1/2 c. 3 1/2 c.  
1/4 kegs, 3 lb. 5 c. 5 1/2 c. 3 1/2 c.  
10 lb cans, 10 6 c. 6 1/2 c. 5 1/2 c.  
In case, less 10 lb cans, less  
than 10 lb. 10 c. 10 c. 8 c.  
**Enameled and Tinned**  
**Ware—**See *Ware, Hollow.*  
**Escutcheon Pins—**  
See *Pins, Escutcheon.*  
**Escutcheons**  
Brass Thread. 60&60&10%  
Door Lock. Same dis. as Door Locks.  
Wood. 25%  
**Expanded Metal—**  
List No. 5.  
Door Mats, Galvanized. 25%  
Fencing, Painted Sheets. 20%  
Galvanized. 10%  
Netting, Painted Sheets. 20%  
Tree Guards, Panoled. 15%  
Window Guards, Panoled. 15%  
**Extractors, Lemon Juice**  
—See *Squeezers, Lemon.*  
**Fasteners, Blind—**  
A. J. White, 3 doz. \$5.50. 50%  
Mackrell's, 3 doz. \$1.00. 20@20&10%  
Security Gravity. 30%  
Van Sand's Old Pat., \$15 gr. 55&10%  
Van Sand's Screw Pat., \$15 gr. 60&10%  
Zimmerman's. 50%  
**Faucets—**  
B. & L. Co.:  
Burnside's Red Cedar. 50%  
Burnside's Red Cedar, bbl. lots. 50&10%  
Cork Lined. 70&5@70&10%  
Fenn's. 40%  
Fenn's Cork Stops. 33%  
Frary's Pat. Petroleum. 70@70&5%  
Metallic Key, Leather Lined. 60&10%  
National Measuring, 3 doz. \$36.00. 25&10%  
John Sommers:  
Peerless Best Block Tin Key. 40%  
IXL, 1st quality, Cork Lined. 50%  
Diamond Lock. 40%  
Perfection Fla. Red Cedar (in boxes) 40%  
Boss Metallic Key. 50%  
Reliable Cork Lined. 60%  
O. K. Western Pattern, Cork Lined. 50%  
No Brand, Red Cedar (in bbls.). 50&10%  
Western Pattern, Metal Key. 40%  
No Brand, Metal Key. 60%  
Self Measuring:  
Enterprise, 3 doz. \$36.00. 33%  
Lane's, 3 doz. \$36.00. 40&5%  
Star. 60%  
Star, Metal Plug, new list. 40%  
Lockport, Metal Plug, reduced list. 60%  
**Felloe Plates—**  
See *Plates, Felloe.*  
**Fibre Ware—**See *Ware, Fibre.*  
**Fibre Wheels—**  
Brewster. 50&5%  
Derby and Cincinnati. 45&5%  
**Files—**Domestic—  
American. 75@75&5%  
Arcade. 70@70&5%  
G. & H. Barnett (Black Diamond)  
70@70&5%  
Eagle. 70@70&10%  
Nicholson Files, Rasps, &c. 70@70&10%  
Nicholson (X.F.) Files. 25%  
Nicholson (extra prices on certain) 75%  
Other makers, best brands. 70&10@75%  
Fair brands. 75@75&10%  
Second quality. 80&80&10%  
Arcade Horse Rasps. 60&60&5%  
Chelsea Horse Rasps, Hand Cut. 50&10%  
Fellers Horse Rasps. 60&10%  
McCauley's Horse Rasps. 50&10&60%  
Trojan Horse Rasps. 60&10&5%  
**Imported—**  
Stubbs. 30%  
Stubbs' list. 25@30%  
**Fixtures, Grindstone—**  
Moore's. 55&10%  
P. S. & W. Co. 50&10&10%  
Reading Hardware Co. 30&10&10%  
Sargent's Patent. 70&10@70&10&10%

**Fluting Machines**  
See *Machines, Fluting.*  
**Fodder Squeezers—**  
See *Squeezers, Fodder.*  
**Forks—**  
Hay, Manure, &c., Asso. List. 70&5&2%  
Hay, Manure, &c., Phila. List. 60&10&2%  
Plated, see *Spoons.*  
**Frames—**  
Red, Polished and Varnished. 50 doz.  
White Vermont. 15.50, 25%  
**Screen, Window and Door—**  
Bonanza Window Screens. 40&10%  
Cortland. 40&40&5%  
Empire Frame Screen Doors. 50 doz. \$12  
Phillips' Window Screen Frames. 50&10@50&10&5%  
Porter's Pat. Window and Door Frame. 60%  
Stearns' Frames and Corners. 25@25&10%  
Wabash Adj. Window Screen. 40&5%  
Warner's Screen Corner Irons. 33%  
**Freezers, Ice Cream—**  
American. 60%  
Artic. 70%  
Blizzard. 70%  
Boss and Pat. 60&10&10&10%  
Buffalo Champion. 65%  
Confectioners' Machine. 50%  
Crown. 60%  
Double Action Crown. 60%  
Gem. 65%  
Giant. 65%  
Good Luck. 65%  
Granite State. 65%  
Hero. 65%  
Home. 65%  
Keystone, P. D. & Co., each \$1.50. 20%  
Model. 60%  
Ohio. 60&10%  
Peerless. 60&10%  
Rapid. 60%  
Shepard's Lightning. 65%  
Standard. 60%  
Standard Double Action. 60%  
Star. 60%  
White Mountain. 60%  
Zero. 70%  
**Fruit and Jelly Presses—**  
See *Presses, Fruit and Jelly.*  
**Fruit Pickers—**  
See *Pickers, Fruit.*  
**Fry Pans—**See *Pans, Fry.*  
**Funnels—**  
Gersdorf's Perfection, Standard and  
Globe, Tin, 1 gro., 10%; 2 to 5 gro.,  
20%; 5 to 10 gro. 30%  
Copper, 1 to 6 doz., 15%; 6 to 12  
doz., 20%; over 12 doz. 25%  
**Furnaces, Soldering**  
Burgess, Nos. 3 and 4 Gem, Copper  
reservoir. \$8.50  
Burgess, Nos. 3 and 4 Gem, tin reser-  
voir. \$7.00  
Clayton & Lambert, No. 1 Fire-Pot.  
\$8.00; No. 2 Fire-Pot. \$12.00  
Fuse—Dis. 10&2% cash. 1000 ft.  
Common Cotton Fuse, for dry gr. \$3.00  
Common Hemp Fuse, for dry gr. \$2.80  
Double Taped Fuse, for very wet gr. \$5.60  
Single Taped Fuse, for very wet gr. \$4.75  
Triple Taped Fuse, for very wet gr. \$6.40  
Large Gutta Percha Fuse, for water. 15.00  
Small Gutta Percha Fuse, for water. 10.00  
**Cates, Molasses—**  
Lincoln's Pattern. 70%  
Stebbin's Genuine. 60&10&10%  
Stebbin's Pattern. 80&10@80&10&10%  
Stebbin's Tinned Ends. 40&10%  
Weed's. 20&10%  
**Cauges—**  
Barrett's Comb, Roller Gauge. 30%  
Hoague & Peck's Champion Gauge.  
With Scale. 30%  
Without Scale. 30%  
Marking, Mortise, &c. 60&10@60&10&10%  
Stanley R. & L. Co.'s Butt & Rabbit  
Gauge. 25&10%  
Starrett's Surface, Center and Scratch.  
25%  
Wire, Brown & Sharpe's. 10@20%  
Wire, Morse's. 25%  
Wire, P. S. & W. Co. 10&10%  
Wire, Wheeler, Madden & Co. 10%  
**Gimlets—**  
Nail and Spike. 60@60&5%  
Diamond Gimlets. 25%  
Eureka Gimlets. 60&10@60&10&5%  
Double Cut, Douglass'. 40&10%  
Double Cut, Ives'. 60&10@60&10&5%  
Double Cut, Shepardson's. 45&10@45&10&5%  
**Glue**  
Dodd's Liquid Glue. 25@25&5%  
Le Page's Liquid. 25@25&5%  
Upton's Liquid. 35%  
**Glue Pots—**See *Pots, Glue.*  
**Grease, Axle—**  
Axleline, tin boxes. 30 gr. \$12.00  
Dixon's Everlasting, 10 lb pails, ea. \$5%  
Dixon's Everlasting, 10 lb. 30 doz. \$1.20; 2 lb. 2 doz. \$2.00  
English Coach, 5 lb tin pails. 30 doz. \$3.50  
English Coach, wooden boxes. 30 doz. \$8.50  
Fraser's, kegs, half bbls. or bbl. 30 doz. \$3%  
Fraser's, tubs. 4 lb, 4 c; pails, 5 c  
Fraser's, small wood boxes. 30 doz. \$9.50  
Fraser's, 5 lb wood boxes. 30 doz. \$3.25  
Lower grades, special brands. 30 gr. \$5.50@7.00  
Tiger, 5 lb tin pails. 30 doz. \$2.85  
Tiger, wooden boxes. 30 doz. \$7.00  
**Grindstones—**  
Cleveland Stone Co.:  
Family, 6 and 7 in. 30 doz. \$5.00  
Family, 8 and 9 in. 30 doz. \$5.75  
Family, 10, 11 and 13 in. 30 doz. \$7.50  
Loose Grindstones, 30 to 200 lb \$8.00  
12.00 @ \$8.00 ton f. o. b. quarries.  
Grafton Stone Co.:  
Family, 6 and 7 in. 30 doz. \$4.00  
Family, 8 and 9 in. 30 doz. \$4.60  
Family, 10, 11 and 13 in. 30 doz. \$6.50  
Loose Grindstones, 30 to 200 lb. \$8.00  
@ \$8.00 ton f. o. b. quarries.  
Mounted Grindstones, No. 1, each \$1.50;  
No. 2, \$1.30; No. 3, \$1.15.  
**Grindstone Fixtures—**  
See *Fixtures, Grindstone.*  
**Gun Powder—**See *Powder.*  
**Hack Saws—**See *Saws.*  
**Hafis, Aul—**  
Peg, Pat. Leather Top. 45 doz. 45@50%  
Peg, Pat. Plain Top. 45 doz. 45@45%  
Sewing Brass Per. 30 gr. \$1.75



Sewing, Pat. Long.....# doz. \$1.20  
Sewing, Pat. Short.....# doz. 45¢@50¢

**Halters—**

Cover's Adj. Rope Halters.....40¢&2¢  
Cover's Adj. Web Halters.....35¢&5¢  
Cover's Hemp Horse and Cattle Tie.....50¢&10¢  
Cover's Jute Cattle Ties.....70¢&2¢  
Cover's Jute Horse Ties.....70¢&2¢  
Cover's Rope, 7-16 in. Jute.....70¢&2¢  
Cover's Rope, 1/2 in. Hemp.....35¢&5¢  
Cover's Saddle Works Halters.....80¢&10¢  
Cover's Saddlery Works Halters.....35¢&5¢  
Cover's Saddlery Works Handy Web Halters.....35¢&5¢  
Cover's Saddlery Works Horse and Cattle Ties.....35¢&5¢

**Hammers—****Handled Hammers—**

Atha Tool Co.....50¢&10¢@60¢  
Humason & Beckley.....50¢&10¢@60¢  
Verree.....40¢&10¢  
Cheney's Claw.....40¢&10¢  
Cheney's Machinists' & Riveting.....50¢&5¢  
C. Hammond & Son.....40¢&10¢  
Magnetic Tack, Nos. 1, 2, 3, 1.25, 1.50, 1.75.....30¢&10¢  
Maydole's, '94 list.....25¢&10¢@40¢  
Peck, Stow & Wilcox.....40¢&10¢  
Fayette R. Plumb.....40¢&10¢  
Artisan's Choice, A. E. Nail.....40¢&12½¢  
Engineers' and B. S. Hand.....40¢&10¢  
Machinists' Hammer.....40¢&10¢  
Plain Y. & P. A. E. Nail.....40¢&12½¢  
Other Nail Hammers.....50¢&10¢  
Sargent's.....60¢&10¢  
Warner & Noble's new list.....25¢&10¢

**Heavy Hammers and Sledges—**

8 lb and under.....# doz. 40¢  
8 to 5 lb.....# doz. 75¢&10¢@80¢  
Over 5 lb.....# doz. 80¢  
Wilkinson's Smiths.....10¢@10¢# doz

**Handcuffs and Leg Irons—**

See Police Goods.

**Handles—****Cross-Cut Saw Handles—**

Atkins.....40¢  
Champion.....45¢&45¢@10¢  
Ely's Perfection.....# doz. \$3.00  
Sensible, # doz. Pr. \$5.00.....60¢

**Iron, Wrought or Cast—**

Barn Door, # doz. \$1.40.....20¢&5¢  
Bronze Iron Drop Latches.....# doz. 60¢  
Chest, Sargent's list.....50¢&10¢@50¢&10¢  
Door or Thumb.....0  
Per doz.....\$0.90 1.00 1.25 1.35 1.50  
60¢&10¢@10¢70¢

Jap'd Store Door Handles—Nuts, 1.62;  
Plate, \$1.10; no plate, \$0.88.....10¢  
Boggin's Latches.....# doz. 28¢@30¢

**Wood—**

Auger, assorted.....# gr. \$5.00 }  
Auger, large.....# gr. 7.00 } 50¢  
File, assorted.....# gr. 2.75 }  
Bradawl.....# gr. 2.00 }  
Apple Firmer Chisel, large.....# gr. \$2.00 }  
Apple Firmer Chisel, large.....# gr. 6.00 }  
Hickory Firmer Chisel, ass'd.....# gr. 4.50 }  
Hickory Firmer Chisel, large.....# gr. 5.00 }  
Socket Firmer Chisel, ass'd.....# gr. 3.00 }  
Socket Firmer Chisel, ass'd.....# gr. 5.00 }  
Chisel, Fibre Brad.....# gr. 3.00 }  
Hammer, Hatchet, Axe, &c.....40¢&10¢  
Hoe, Rake, Shovel, &c.....60¢&10¢  
Pat. Auger, Douglass.....# set \$1.25 }  
Pat. Auger, Ives.....# set \$1.00 }  
Pat. Auger, Swann's.....# set \$1.00 }  
Saw and Plane.....40¢&10¢@50¢

**Hangers—**

Barn Door, New England.....70¢&70¢5¢  
Barn Door, old patterns.....70¢&70¢5¢  
Barry.....50¢  
Best Anti-Friction.....60¢&10¢@60¢&10¢5¢  
Boss.....60¢&10¢@60¢&10¢5¢  
Champion.....60¢&10¢  
Chicago Anti-Friction.....55¢&5¢5¢  
Climax Anti-Friction.....55¢&5¢5¢  
Crescent.....60¢&10¢@60¢&10¢  
Crunk's Patent, Steel Covered.....60¢&10¢  
Duplex (Wood Track).....60¢&10¢  
Economy.....50¢&10¢  
Hamilton Wrought Steel Track.....55¢  
Interstate.....60¢&10¢@60¢&10¢  
Kiddler's.....50¢&10¢@60¢&10¢  
Lane's Parlor.....40¢&10¢  
Lane's Standard.....60¢&10¢@60¢&10¢  
Lane's Covered.....60¢&10¢@60¢&10¢  
Lundy Steel Parlor.....40¢  
Magic.....50¢&10¢@60¢&10¢  
Matchless.....60¢&10¢@60¢&10¢  
Moody.....45¢  
Moore's Baggage Car Door.....33¢  
Moore's Elevator.....33¢  
Moore's Railroad.....55¢  
Nickel, Steel, Nos. 0, 25; 1, 20; 2, 15.....40¢&10¢@50¢

Orleans Steel.....40¢&10¢@50¢  
Paragon, No. 1, \$3.50; No. 2, \$4.50; No. 3, \$5.50 # doz.....  
Paragon Parlor.....# set \$2.00  
Pendulum, Payson's.....40¢&10¢  
Perfection.....50¢&10¢@50¢&10¢5¢  
Richards'.....30¢&30¢10¢  
Samson Steel Anti-Friction.....40¢&10¢@40¢&10¢  
Star.....20¢&10¢@20¢&10¢  
Stearns' Anti-Friction.....20¢&10¢@20¢&10¢  
Stearns' Challenge.....25¢&10¢@25¢&10¢  
Sterling.....50¢&10¢@50¢&10¢  
Terry's Ideal.....50¢&10¢@50¢&10¢  
Terry's Modern.....50¢&10¢@50¢&10¢  
Terry's Shield.....50¢&10¢@50¢&10¢  
Terry's Solid.....50¢&10¢@50¢&10¢  
Terry's Wrought Single Strap.....50¢&10¢  
Victor, No. 1, \$15.00; No. 2, \$10.50; No. 3, \$18.00.....50¢&2¢  
Warner's Pat.....20¢&10¢@20¢&10¢  
Wild West.....50¢&10¢@50¢&10¢  
Zenith for Wood Track.....55¢

**Harness Snaps—See Snaps.****Hatchets—**

American Axe and Tool Co.:  
Blood's.....40¢ & 10¢  
Hunt's.....40¢ & 10¢  
Lund's.....40¢ & 10¢  
Mann's.....40¢ & 10¢  
Underhill's.....40¢ & 10¢  
C. Hammond & Son.....40¢ & 10¢  
Fayette R. Plumb.....10¢  
Collins.....50¢ & 10¢  
Kelly's.....50¢ & 10¢  
P. S. & W. Co.....50¢ & 10¢  
Sargent & Co.....50¢ & 10¢  
Schulte, Lohoff & Co.....50¢ & 10¢  
Ten Eyck Edge Tool Co.....50¢ & 10¢

**Hay and Straw Knives—**

See Knives.

**Hinges—****Blind Hinges—**

Clark's:  
Nos. 1, 3, 5, 1868, Old Pattern.....75¢&10¢5¢  
Nos. 1 and 3, Tip Pattern.....75¢&10¢5¢  
No. 50, Buffalo Noiseless, 40, 60 and 65.....75¢  
Buffalo Reversible, Nos. 3, 2, 1.....75¢  
No. 1, Cottage, for wood only.....80¢&10¢  
No. 1, Diamond, for wood only.....80¢&10¢  
Dixie L. & P., Nos. 3, 2½, 2, 1½, 1, 0, 4 and 5.....75¢&10¢  
No. 25, Empire Reversible.....75¢&10¢  
Lull & Porter, Nos. 3, 2½, 2, 1½, 1, 0, 4 and 5.....75¢&10¢2½¢  
Mortise Gravity, Nos. 2, 4, 4½, 6, 8, 9 and 10.....50¢  
Huffer.....50¢&10¢  
Parker.....75¢&10¢  
North Atlantic Blind Fixtures, No. 2, for Wood, \$9.00; No. 3, for Brick.....10¢  
Reading's Gravity.....75¢&10¢@75¢&10¢5¢  
Sargent's, Nos. 1, 3, 5, 11, 12, 13.....75¢&10¢@75¢&10¢5¢  
Shepard's:  
Acme Lull & Porter, Nos. 3, 2½, 2, 1½, 1, 0, 0, 4 and 5.....75¢&10¢  
Buffalo Gravity Locking, Nos. 1, 3 and 5.....80¢&5¢  
Champion Gravity Locking, No. 75.....80¢&10¢  
1868, Old Pat'n, Nos. 1, 3 & 5.....80¢&10¢  
Tip Pattern, Nos. 1, 3 and 5.....75¢&10¢5¢  
Double Locking, Nos. 20 and 25.....70¢&5¢  
Empire, Nos. 101 and 103.....75¢&5¢  
Niagara Gravity Locking, Nos. 1, 3 and 5.....80¢&5¢  
Noiseless, Nos. 50, 60, 65 and 70.....70¢  
O. S. Lull & Porter, Nos. 3, 2½, 2, 1½, 1, 0, 0, 4 and 5.....75¢&10¢2½¢  
Pioneer, Nos. 080, 45 and 5½.....75¢  
Steamboat Gravity Locking, No. 10.....80¢&10¢

**Gate Hinges—**

Automatic, # doz. \$12.50.....50¢  
Clark's, Nos. 1, 2, 3.....60¢&10¢@60¢&10¢  
N. E. # doz. \$7.80.....60¢&10¢  
N. E. Reversible, # doz. \$5.60.....60¢&10¢  
N. Y. State, # doz. \$4.90.....60¢&10¢  
Shepard's, Nos. 1, 2, 3.....60¢&10¢@60¢&10¢5¢  
Western, # doz. \$4.20.....60¢&10¢

**Spring Hinges—**

Acme.....30¢  
American.....20¢  
Bardsley's Patent Checking.....15¢  
Barker's Double Acting.....25¢  
Bommer's Japanned.....35¢  
Bommer's All other Kinds.....30¢  
Buckman's.....15¢@60¢  
Champion.....60¢  
Chicago.....30¢  
Columbia.....# gr. \$10.00 }  
Crown.....20¢  
Devore, No. 1.....# gr. \$13.00 }  
Freeport.....# gr. \$12.00 }  
Geer's Spring and Blank Butts.....40¢  
Gem.....20¢  
Ideal No. 3.....# gr. \$8.00 }  
J. G. C. Covered, # gr. \$30.....50¢&5¢  
Knoxall.....# gr. \$12 }  
New Idea No. 1.....# gr. \$10.00 }  
New Idea No. 2.....# gr. \$18.00 }  
New Idea Dial Acting.....45¢  
No. 10 Matchless.....60¢  
No. 25 Unbreakable.....60¢  
Oxford.....20¢  
Reliable.....60¢  
Rex.....# gr. \$18.00 }  
Royal.....# gr. 60¢ }  
Samson.....60¢&10¢@75¢  
Stearns' Noiseless Floor Hinge, # set \$5.00.....20¢&10¢@30¢  
Surprise.....# gr. \$12.00 }  
Union Mfg Co.....25¢  
Union Spring Hinge Co.'s, list March '94.....20¢  
Wiles' No. 1, # gr. \$16; No. 2.....\$13

**Wrought-Iron Hinges—**

Strap and T, list May.....60¢&10¢@60¢&10¢  
Corrug'd Strap and T.....60¢&10¢@60¢&10¢  
Plate Hinges, 8, 10 & 12 in., # b.....5¢  
Providence, over 12 in., # b.....4¢  
Rolled Blind Hinges, Nos. 32 and 34.....50¢&10¢  
Rolled Blind Hinges, Nos. 232 and 234.....55¢&10¢  
Rolled Plate.....70¢&10¢  
Rolled Raised.....70¢&10¢  
Screw Hook and Eye.....# in. # b 7½¢  
# 10 in. # b 5½¢  
# 14 in. # b 4½¢  
# 16 to 20 in. # b 3½¢  
Strap.....(22 to 36 in.) # b 2½¢

**Hoes—**

Scovill and Oval Pattern.....50¢&10¢@60¢  
D. & H. Scovill.....20¢&30¢  
Grub.....60¢&10¢  
Lane's Crescent, Planters' Pattern.....45¢&5¢  
Lane's Razor Blade, Scovill Pat.....30¢&5¢

**Handled—**

Garden, Mortar &c.....70¢&70¢5¢  
Magic.....# doz. \$4.00 }  
Planter's, Cotton, &c.....70¢&70¢5¢  
Warren Hoe.....80¢&10¢@80¢

**Hog Rings and Ringers—**

See Rings and Ringers.

**Hoisting Apparatus—**

See Machines, Hoisting

**Hollow-Ware—**

See Ware, Hollow.

**Holders—**

Bag -  
Sensible Bag and Twine.....50¢  
Springle's Pat., # doz. \$18.00.....60¢

**Bit—**

Angular, # doz. \$24.00.....40¢&5¢  
Extension.....40¢&5¢  
Barber's, # doz. \$15.00.....40¢&10¢  
Ives, # doz. \$20.00.....60¢&10¢@60¢&10¢

**File and Tool—**

Balz Pat., # doz. \$4.00.....25¢  
Nicholson File Holders.....20¢

**Sash—**

Motley's Adj. Sash, Medium Size, # doz. \$1.20.....40¢

**Hooks—**

Cast Iron—  
Bird Cage, Reading.....60¢&10¢@60¢&10¢  
Bird Cage, Sargent's List.....70¢  
Clothes Line, Sargent's List.....50¢&10¢@50¢&10¢  
Clothes Line, Moore's.....50¢&10¢@50¢&10¢  
Clothes Line, Reading list.....70¢  
Coat and Hat, Moore's.....70¢  
Coat and Hat, Reading.....70¢  
Coat and Hat, Sargent's list.....50¢&10¢@50¢&10¢  
Hammock, E. C. Stearns & Co., # doz. 60¢  
Harness, Reading list.....55¢&10¢@55¢&10¢

**Wire—**

Atlas, Coat and Hat.....33½¢  
Belt.....80¢&15¢@80¢&20¢  
Handy Hat and Coat.....50¢&10¢@50¢&10¢  
Indestructible Coat and Hat.....45¢&45¢5¢  
Williamson's Bird Cage Hooks, list April, '92.....40¢  
Wire Coat and Hat, Gem, list April, '92.....60¢&10¢@60¢&10¢  
Wire Coat and Hat, Miles, list April, '92.....50¢&10¢@50¢&10¢  
Wire Coat and Hat, Standard.....60¢&10¢@60¢&10¢  
Bright Wire Goods—See Wire.

**Wrought Iron—**

Cotton.....# doz. \$1.25  
Cotton Pat. (N. Y. Mallet and Handle Wks).....90¢  
Tassel and Picture, T. & S. Mfg. Co.....50¢  
Wrought Staples, Hooks, &c.....See Wrought Goods.

**Miscellaneous—**

Bush.....55¢@60¢  
Fish Hooks, America.....50¢  
Grass, No. 2, \$2.00; No. 3, \$2.10; No. 4.....\$2.25  
Hooks and Eyes—Brass.....60¢&10¢@60¢&10¢  
Hooks and Eyes—Malleable Iron.....70¢&10¢  
Noll's Grass.....# doz. \$2.25  
Whiffetree, Patent.....55¢  
Bench Hooks—See Bench Stops.

**Horse Nails—See Nails, Horse.****Horse Shoes—**

See Shoes, Horse.

**Hose, Rubber—**

Competition, Fair quality.....75¢&75¢10¢  
Competition, Low Grade, # in. # ft. 5¢  
Extra.....60¢&10¢@60¢&10¢  
Standard.....70¢&10¢@70¢&10¢5¢  
N. Y. B. & P. Co., Carbon.....70¢  
N. Y. B. & P. Co., Double Diamond.....50¢&10¢5¢  
N. Y. B. & P. Co., 1846 Para.....50¢&10¢5¢  
Cotton Garden, # in. coupled.....# ft. 7¢  
Fair quality.....# ft. 8½¢  
Good quality.....# ft. 8½¢

**Huskers—**

Blair's Gloves, # doz. pair:  
No. 138, \$6; No. 142, \$7; No. 145, \$7;  
No. 146, \$9; No. 150, \$9; No. 152, \$7.50;  
No. 170, \$2.....6¢  
Blair's Pins, # gross:  
No. 160, \$7; No. 165, \$10.50.....6¢  
Boss, Style A and B, \$2.40; E, \$2.10 # doz., net.....  
Hubbard's Solid Steel, # gr. \$6.00.....33½¢

**Indurated Fiber Ware—**

See Ware, Indurated Fiber.

**Irons—**

Curling—  
Nichol's Patent Curling Iron Heater, # doz. \$1.00  
Silver Tipped Grace Darling Curling Iron, # doz.:  
No. 65.....\$1.75  
No. 66.....\$1.50  
No. 67, Mustache.....\$1.25

**Sad—**

From 4 to 10, at factory.....# 100 lb \$2.25 @ 2.35  
B. B. Sad Irons, # b (at factory) 25¢@23¢  
Chinese Laundry (N. E. Butt Co.), # 5½¢  
Chinese Sad.....# 3¢@3½¢  
Crown Improved.....60¢&10¢@60¢&10¢  
Ideal Irons, No. 250, # set, 60¢; No. 255.....55¢  
Mahony's Troy Pol. Irons.....35¢  
Mrs. Potts' Sad Irons, per set:  
Small lots.....\$0.70 65 75 70 65  
National Self-Heating.....30¢  
New England.....20¢&10¢  
Pottstown, # set, No. 45, 65¢; No. 40, 70¢  
Salamander Irons.....25¢&10¢  
Self-Heating, # doz. \$10.00.....20¢  
Self-Heating Tallow, # doz. \$22.50.....25¢  
Sensible Sad Iron, # set:  
Nos. 2, 3, 20, 30.....\$0.60 60 65 65  
\$0.60 60 65 65  
Sensible Tailors' Irons.....33½¢

**Soldering—**

Soldering Coppers.....# b 18¢@19¢  
Cover's Adjustable, list Jan. 1, '94.....35¢&2¢  
Tinker's Sargent.....# doz. \$1.75; # gr. \$18

**Pinking—**

Pinking Irons.....# doz. 55¢@60¢

**Jack Screws—See Screws.****Jacks, Wagon—**

Daisy.....33½¢&5¢  
Lockport.....40¢&40¢5¢  
Victor.....33½¢

**Kettles—**

Brass Spun, Plain, list Jan. 1, '01, 25¢&5¢  
Brass Spun, Pld. W. M., list Jan. 1, '01.....20¢&5¢  
Stamped Brass Kettles.....# b 19¢@20¢  
Enameled and Tea—See Ware, Hollow.

**Knife Sharpeners—**

See Sharpeners, Knife.

**Knives—**

Butcher, Shoe, &c.....40¢&10¢@40¢&10¢  
Ames' Bread Knives, # doz. \$1.50.....15¢@20¢  
Ames' Butcher Knives.....25¢  
Ames' Shoe Knives.....25¢@30¢  
Dick's Butcher Knives and Steels.....40¢  
Foster Bros., Butcher, &c.....25¢&25¢10¢  
Moran's Shoe and Bread.....25¢&25¢10¢  
Nichols' Butcher Knives.....50¢  
Wilson's Butcher Knives, list Dec. 8, '90.....75¢  
W. W. Wilson, Butcher, 6 in., \$2.00; 7 in., \$2.25; 8 in., \$3.80, &c.....  
Hay and Straw—See Hay & Knives.

Table and Pocket—Net Prices

**Corn—**

Bradley's.....10¢  
Wadsworth's.....25¢&25¢10¢

**Drawing—**

Mix.....80¢&80¢5¢  
P. S. & W.....25¢@33½¢  
Witherby.....35¢  
Adjustable Handle.....75¢&75¢10¢  
Douglass.....60¢&10¢@60¢&10¢  
Merrill.....25¢&10¢@25¢  
Watrous.....20¢&5¢  
L. & I. J. White.....25¢&25¢5¢  
Wilkinson's Folding.....40¢&7½¢@40¢&10¢

**Hay and Straw—**

Blizzard.....\$5.50¢@6.50  
Carter's Needle.....# doz. \$8.00¢@8.50  
Lightning, from Jobbers.....\$6.50¢@7.50  
Nolin's Hay.....# doz. \$6.00¢@6.50  
Wadsworth's.....40¢&7½¢@40¢&10¢

**Mincing—**

Am. (2d quality), # gr. 1 blade, \$7; 2 blades, \$12; 3 blades, \$18.....net  
Buffalo Adjustable, # doz. \$5.00.....33½¢  
Knapp & Cowles.....50¢&10¢@60¢  
Smith's, # doz., Single, \$2; Double, \$3.....45¢@50¢  
Sensible, Nos. 10, 20, 40 & 60.....40¢

**Knobs—**

Bardsley's Wood Door, Shutter, &c.....15¢  
Base, Rubber Tip.....70¢&10¢5¢  
Carriage, Jap., # gr. 80¢.....80¢&10¢  
Door, Mineral.....80¢&10¢  
Door, Por. Jap'd.....70¢&75¢  
Door, Por. Nickel.....\$2.00¢@2.25  
Door, Por. Plated Nickel.....\$2.00¢@2.25  
Drawer, Porcelain.....60¢&10¢@60¢&10¢  
Hemacite Door Knobs.....50¢  
Hemacite, Hemacite.....55¢&5¢  
Hemacite, Ludd's.....60¢&10¢@60¢&10¢  
Picture, Sargent's.....70¢&10¢  
Shutter, Porcelain.....65¢&10¢  
Yale & Towne Wood, list Dec., '85.....40¢

**Ladders—**

Davies Extension and Single.....30¢&5¢

**Ladies—**

Melting, P. S. & W.....35¢&10¢@40¢  
Melting, Reading.....35¢&10¢  
Melting, Sargent's.....60¢&10¢@60¢  
Melting, Warner's.....30¢

**Lanterns—**

Tubular—  
Anti-Friction, with Guard.....\$4.00  
Brass Plated, Sq. Lift, Guard.....\$5.00  
Cop. Plated, Sq. Lift, Guard.....\$5.00  
O. K., with Guard.....\$3.50  
Regular, with Guard.....\$3.25  
Side Lift, with Guard.....\$3.60  
Square Lift, with Guard.....\$3.85  
Bull Tubular Head Lights, # doz. \$20.00

**Bulls' Eye Police—**

2½-inch flash light.....# doz. \$4.00  
3-inch flash light.....# doz. \$4.50  
2½-inch regular.....# doz. \$3.60  
3-inch regular.....# doz. \$3.90

**Lawn Mowers—**

See Mowers, Lawn.

**Leaders, Cattle—**

Humason, Beckley & Co.'s.....70¢&10¢@70¢&10¢  
Peck, Stow & W. Co.....80¢&10¢  
Sargent's.....70¢&10¢@70¢&10¢

**Lemon Squeezers—**

See Squeezers, Lemon.

**Lifters, Transom—**

Beardsley, Sure Grip.....50¢&10¢  
Beardsley, Sure Grip.....60¢&10¢  
Payson's.....80¢  
Imperial.....70¢  
Solid Grip.....60¢&10¢  
Universal.....60¢&10¢  
Reither's, list Feb. 20, '91



## Pruning Hooks and Shears—See Shears.

### Pullers Nail—

Eclipse,  $\frac{1}{2}$  doz. \$24.00. 40%  
Economy,  $\frac{1}{2}$  doz. \$5.50@6.00  
Ellrich,  $\frac{1}{2}$  doz. \$10.00  
Giant, No. 1  $\frac{1}{2}$  doz. \$18.00; No. 1  $\frac{1}{2}$  doz. \$18.50  
No. 2 \$15.00. 20%  
Pelican,  $\frac{1}{2}$  doz. \$9.00. 25%  
Scranton,  $\frac{1}{2}$  doz. \$18.00, 33% $\frac{1}{2}$  doz. \$10%

### Pulleys—

Brass Screw, 70%  
Hay Fork, "Anti-Friction," 5-in. solid \$5.70. 50%  
Hay Fork, "F" Common and Patent Bushed. 20%  
Hay Fork, Moore's Anti-Friction, 5-in. Wheel,  $\frac{1}{2}$  doz. \$12.00. 40%  
Hay Fork, Reed's Anti-Friction, 6-in. Wheel,  $\frac{1}{2}$  doz. \$12.00. 40%  
Hay Fork, Solid Eye, \$4.00. Swivel. \$4.50. 50%  
Hay Fork, Stearns' No. 35 & 45. 50%  
Hay Fork, Stearns' Nos. 15, 25, 50, 60, 80. 20%  
Hot House, Axle,  $\frac{1}{2}$  doz. \$10.00. 20%  
Japanned Clothes Line. 60%  
Japanned Screw. 70%  
Japanned Side. 70%  
Moore's Ceiling or End, Anti-Friction. 40%  
Moore's Dumb Waiter, Anti-Friction. 50%  
Moore's Light. 33%  
Moore's Side, Anti-Friction. 50%  
Sash (Auger Mortise). On bbl. lots ex. 5%  
Common Sense. 60%  
Empire. 60%  
Acme. 60%  
Ideal, Nos. 2, 4, 10 & 15. 60% less 1¢  
Star. 60%  
Ideal, or IXL No. 80.  $\frac{1}{2}$  doz. 22¢ net.  
Shade Rack. 45%  
Shepard's Niagara, No. 25,  $\frac{1}{2}$  doz. 23¢ net.  
Tackle Blocks—See Blocks.

### Pumps—

Cistern, Best Makers. 60%  
Pitcher Spout, Best Makers. 70%  
Pitcher Spout, Cheap G'ds. 75%  
Myers' Pumps, low list. 55%  
Detroit Valve & Washer Co.'s Pump. 55%  
Leathers.  $\frac{1}{2}$  gr. \$6.00

### Punches—

Avery's Revolving. 40%  
Avery's Sawset and Punch—See Sawsets.  
Bemis & Call Co.'s Cast Steel Drive. 50%  
Bemis & Call Co.'s Spring. 50%  
Bemis & Call Co.'s Springfield Socket. 65%  
Niagara Hollow Punches. 20%  
Niagara Solid Punches. 15%  
Rice Hand Punches. 15%  
Saddlers' or Drifters' good.  $\frac{1}{2}$  doz. 60¢  
Spring, good quality.  $\frac{1}{2}$  doz. \$2.50 @ 2.00  
Spring, Leach's Pat. 15%  
Solid Thinners, P., S. & W. Co.,  $\frac{1}{2}$  doz. \$1.44. 55%  
Hollow Thinners, P., S. & W. Co., 20% $\frac{1}{2}$  doz.

### Rail—

Barn Door, Light. In.  $\frac{1}{2}$  1.75 2.10 2.75  
B. D., for N. E. Hangers: Small. Med. Large.  
100 feet. 32.00 2.50 3.00 net  
Cronk's Double Braced Steel Rail,  $\frac{1}{2}$  foot. 33¢  
Lundy Parlor Door, Planed Edge,  $\frac{1}{2}$  ft. 7¢  
Moody Steel Rail,  $\frac{1}{2}$  ft. 5¢. 45¢  
Moore's Steel Rail. 35%  
Sliding Door, Bronzed Wrt Iron,  $\frac{1}{2}$  ft. 6¢  
Sliding Door, Iron, Painted,  $\frac{1}{2}$  ft. 2¢  
Sliding Door, Wrt Brass,  $\frac{1}{2}$  ft. 2¢  
Terry's Steel Rail. 4¢  
Victor Track Rail,  $\frac{1}{2}$  ft. 7¢. 50% $\frac{1}{2}$  doz.

### Rakes—

Cast Steel, Association g'ds. 70%  
Cast Steel, outside g'ds. 70%  
Malleable, good. 70%  
Malleable, low grade. 70%  
Fort Madison Prize Bow Brace and Peerless. 65%  
Fort Madison Steel Tooth Lawn Rake, \$8.00. 25%  
Gibbs' Acme Lawn Rake.  $\frac{1}{2}$  doz. \$4.90  
Gibbs' Acme Lawn Rake.  $\frac{1}{2}$  doz. \$4.75  
Gibbs' Canton Lawn Rake.  $\frac{1}{2}$  doz. \$3.75  
Gibbs' Crown Lawn Rake, No. 1,  $\frac{1}{2}$  doz. \$4.90; No. 2. 50%  
Gibbs' Favorite Lawn Rake.  $\frac{1}{2}$  doz. \$3.90  
Gibbs' Hustler No. 0.  $\frac{1}{2}$  doz. \$4.25  
Gibbs' Hustler No. 1.  $\frac{1}{2}$  doz. \$4.40  
Onedala Lawn Rake.  $\frac{1}{2}$  doz. \$6.00

### Razors—

Campbell Cutlery Co. 50%  
Electric Cutlery Co. Net prices  
Galvanic.  $\frac{1}{2}$  doz. \$15.00  
Jordan's AAAI, new list. Net prices  
Jordan's Old Faithful, new list. Net prices  
J. R. Torrey Razor Co. Net prices  
Wostenholm and Butcher, \$10 to 2. 10%

### Razor Straps—

See Straps, Razor.

### Reels—

Stearns' Clothes Line—33% $\frac{1}{2}$  doz.  
Fishing  
Hendryx Aluminum, German Silver, Gold, Bronze, Silver, Rubber, Poplar and Salmon, Single Action, Multiplying and Quadruple, alizes. 25%  
Hendryx Single Action Series, 102P and PN, 202P and PN, 102 PR and PN, 202 PR and PN, 304 P and PN, 00304P and PN, 502 and 502N, 802 and 802N, 020084N, Competitor 50%  
Hendryx Multiplying and Quadruple Series, 3004N and PN, 4N and PN, 2904N, 2904P and PN, 002904P, 0924 and 0924N, 5009N and PN, 40% $\frac{1}{2}$  doz.  
Moore's Bronze Finishes. 75%  
Moore's Electroplated. 80%  
Moore's Japanned. 80%  
Moore's Solid Bronze. 70%  
Moore's Stove Pipe. 33% $\frac{1}{2}$  doz.  
Cash Registers  
Morford. each, \$35.00

### Rings and Ringers—

Bull Rings—  
Humason, Beckley & Co.'s. 80%  
Peck, Stow & W. Co.'s. 80%  
Sargent's  
Hog Rings and Ringers—  
Note—The market on Hog Rings and Ringers is in a demoralized condition and prices are low and irregular. We therefore withdraw quotations for the present.

### Rivets and Burrs—

Copper. 60% $\frac{1}{2}$  doz.

Iron Norway, list Nov. 1, '94. 85%  
Second quality. 75%

### Rivet Sets—See Sets.

### Roasting and Baking Pans—See Pans, Roasting and Baking

### Rods—

Stair, Black Walnut.  $\frac{1}{2}$  doz. 40¢  
Stair, Brass. 25% $\frac{1}{2}$  doz.

### Rollers—

Acme Moore's Anti-Friction. 50%  
Barn Door, Sargent's list. 60%  
Lans, Stay. 33%  
Moore's Barn Door Stay. 50%  
Union Barn Door Roller. 70%  
Thompson's Mfg. Co.'s Lawn Rollers. 30%

### Rope—The following prices are f. o. b., New York or factory, and are shaded $\frac{1}{4}$ ¢ on large lots; terms, $\frac{1}{4}$ ¢ for cash.

Manila, 7-16 in. diam. and larger. 73%  
Manila, 1/4 in. 84%  
Manila, 1/2 and 5/16 in. 84%  
Manila, Tarred Rope. 74%  
Manila, Hay Rope, Med'm. 74%  
Sisal, 7-16 in. and larger. 54%  
Sisal, 1/4 in. 64%  
Sisal, Hay Rope. 54%  
Sisal, Tarred Rope. 44%  
Sisal, Medium Lath Yarn. 44%  
New Zealand, 7-10 in. and larger. 54%  
New Zealand, 1/4 in. 54%  
New Zealand, 1/2 and 5/16 in. 54%  
New Zealand Hay Rope. 54%  
New Zealand Tarred Rope. 44%  
Cotton Rope. 12%  
Jute Rope. 54% $\frac{1}{2}$  doz.

### Wire Rope—

List Sept. 1, '94. All kinds. 20%

### Rules—

Boxwood. 80%  
Ivory. 50%  
Starrett's Steel Rules and Straight Edges. 25% $\frac{1}{2}$  doz.

### Sad Irons—

See Irons, Sad.

### Sand and Emery Paper and Cloth—

See Paper and Cloth.

### Sash Cords—See Cord, Sash.

### Sash Locks—See Locks, Sash.

### Sash Weights—

See Weights, Sash.

### Sausage Stuffers or Fillers—See Stuffers or Fillers, Sausage.

### Saws—

Note—Extra 5@10% often given.

Atkins' Circular. 50%  
Atkins' Band. 50%  
Atkins' Cross Cuts, new. 50%  
Atkins' Mulay, Mill and Drag. 50%  
Atkins' One-Man Saw. 40%  
Atkins' Wood Saws. 40%  
Atkins' Hand, Compass, &c. 40%  
Disston's Circular. 45%  
Disston's Cross Cut, list Jan. 1, '93. 40%  
Disston's Hand. 25%  
C. E. Jennings & Co.'s. 25%  
Peace Circular and Mill. 45%  
Peace Cross Cuts, list Jan. 1, '93. 45%  
Peace Hand, Panel and Rip. 25%  
Richardson's Circular and Mill. 45%  
Richardson's X Cuts, list Jan. 1, '93. 45%  
Richardson's Hand, &c. 25%  
Simonds' Circular Saws. 45%  
Simonds' Crescent Ground Cross Cut Saws. 30%  
Simonds' One-Man Cross Cuts. 40%  
Simonds' Gang Mill, Mulay and Drag Saws. 45%  
Wheeler, Madden & Clemens Mfg. Co. Cross Cuts, list Jan. 1, '93. 45%  
Hand, Panel and Rip. 30%  
Woodrough & McParlin: Cross Cuts, list Jan. 1, '93. 45%  
Hand, Panel and Rip. 25% $\frac{1}{2}$  doz.

### Hack Saws—

Eureka and Crescent. 25%  
Griffin's complete. 40%  
Griffin's Hack Saw Blade. 40%  
Star Hack Saws and Blades. 25%  
Barnes' No. 1, \$8; No. 6, \$10; No. 7, \$15. 25%  
Barnes Scroll Saw Blades. 35%  
Lester, complete, \$10.00. 25%  
Rogers, complete, \$4.00. 25%

### Saw Frames—

See Frames, Saw.

### Saw Sets—See Sets, Saw.

### Saw Tools—See Tools, Saw.

### Scale Beams—

See Beams, Scale.

### Scales—

Chaillon's Eureka. 25%  
Chaillon's Favorite. 40%  
Chaillon's Grocers' Trip Scales. 50%  
Family, Turnbills. 30%  
Hatch, Counter, No. 171, good quality.  $\frac{1}{2}$  doz. \$17.00 @ 18.00  
Hatch, Tea, No. 161.  $\frac{1}{2}$  doz. \$9.00 @ 9.50  
Riehle Bros' Platform. 40%  
Union Platform, Striped. \$2.00 @ 2.10  
Standard. 60%  
Scissors, Fluting. 45%

### Scrapers—

Adjustable Box Scraper (S. R. & L. Co.) \$8.00. 40%  
Box, 1 Handle.  $\frac{1}{2}$  doz. \$2.00  
Box, 2 Handle.  $\frac{1}{2}$  doz. \$3.00 @ 4.00  
Foot. 50%  
Ship, Common.  $\frac{1}{2}$  doz. \$5.50  
Ship, R. I. Tool Co. 25%  
Tatum's Box. 25% $\frac{1}{2}$  doz.

### Screen Window and Door Frames—

See Frames, Screen.

### Screw Drivers—

See Drivers, Screw.

### Screws—

Bench and Hand—  
Bench, Iron. 55%  
Bench, Wood, Beech.  $\frac{1}{2}$  doz. \$2.25  
Bench, Wood, Hickory. 20%  
Hand, Wood. 25%  
Hand, Grand Rapids. 35%  
Coach, Lag and Hand Rail—  
Lag, Blunt Point, list Jan. 1, '93. 85%  
Coach and Lag, Gimlet Point, list Jan. 1, '93. 80% $\frac{1}{2}$  doz.

Hand Rail, Am. Screw Co. 80%  
Hand Rail, H. & B. Mfg. Co. 75%  
Hand Rail, Sargent's. 70% $\frac{1}{2}$  doz.

### Jack Screws—

Millers Falls. 50%  
Millers Falls, Roller. 50%  
P. S. & W. 35%  
Sargent. 70%  
Stearns'. 70%  
Tatum's. 25% $\frac{1}{2}$  doz.

### Cork

Detroit Cork Screw Co. 33%  
Humason & Beckley Mfg. Co. 40%  
Williamson's. 33%  
Williamson's Forged Worm, Applewood Handle,  $\frac{1}{2}$  doz. \$5.00; Rosewood, \$5.50. 40%

### Machine—

List August 1, '94.

Flat Head, Iron. 45%  
Round Head, Iron. 40%

### Wood—

List January 1, '91.  
Flat Head, Iron. 85%  
Round Head, Iron. 75%  
Flat Head, Brass. 85%  
Round Head, Brass. 75%  
Flat Head, Bronze. 80%  
Round Head, Bronze. 75%  
Rogers' Drive Screws. 87%  
Extra 10% often given.

### Scroll Saws—See Saws, Scroll.

### Scythes—

Grain. 40%  
Grass. 40% $\frac{1}{2}$  doz.

### Scythe Snaths—

See Snaths, Scythe.

### Sets—

Alken's Sets, Awns and Tools: No. 20,  $\frac{1}{2}$  doz. \$10.00. 60%  
No. 42, \$10.50; No. 43, \$12.50; No. 44, \$12.50; No. 45, \$12.50; No. 46, \$12.50; No. 47, \$12.50; No. 48, \$12.50; No. 49, \$12.50; No. 50, \$12.50; No. 51, \$12.50; No. 52, \$12.50; No. 53, \$12.50; No. 54, \$12.50; No. 55, \$12.50; No. 56, \$12.50; No. 57, \$12.50; No. 58, \$12.50; No. 59, \$12.50; No. 60, \$12.50; No. 61, \$12.50; No. 62, \$12.50; No. 63, \$12.50; No. 64, \$12.50; No. 65, \$12.50; No. 66, \$12.50; No. 67, \$12.50; No. 68, \$12.50; No. 69, \$12.50; No. 70, \$12.50; No. 71, \$12.50; No. 72, \$12.50; No. 73, \$12.50; No. 74, \$12.50; No. 75, \$12.50; No. 76, \$12.50; No. 77, \$12.50; No. 78, \$12.50; No. 79, \$12.50; No. 80, \$12.50; No. 81, \$12.50; No. 82, \$12.50; No. 83, \$12.50; No. 84, \$12.50; No. 85, \$12.50; No. 86, \$12.50; No. 87, \$12.50; No. 88, \$12.50; No. 89, \$12.50; No. 90, \$12.50; No. 91, \$12.50; No. 92, \$12.50; No. 93, \$12.50; No. 94, \$12.50; No. 95, \$12.50; No. 96, \$12.50; No. 97, \$12.50; No. 98, \$12.50; No. 99, \$12.50; No. 100, \$12.50; 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Covert, New R. E. 60&10&5&2%  
 Fitch's Bristol. 50%  
 Fitch's National. 50&10&10%  
 Fitch's Clipper. 60&10%  
 Fitch's Union. 60&10%  
 Fitch's Champion. 50%  
 German, new list. 40&10%  
 Kelley & Woolworth's Steel Harness. 60&60&10%  
 John Protz Snaps. 75&75&5%  
 Sargent's Patent Guarded. 70&10&10&70&10&10%  
**Snaths**  
 Scythe. 60&60&5%

**Snips, Tinner's—See Shears.**  
**Soldering Irons—**  
 See Irons, Soldering.  
**Spittoons, Cuspidors, &c.**  
 Standard Fiber Ware—  
 Cuspidors, 8 1/2-inch, 1/2 doz., No. 5, \$5; No. 5 1/2, \$5.  
 Spittoons, Daisy, 8-inch, No. 1, 4, 10 and 11 inch, \$6.

**Spoke Shaves—**  
 See Shaves, Spoke.  
**Spoke Trimmers—**  
 See Trimmers, Spoke.  
**Spoons and Forks—**  
 Tinned Iron—  
 Basting, Cen. Stamp. Co's list. 70&25%  
 Buffalo, S. S. & Co. 33 1/2&2%  
 Solid Table and Tea, Cen. Stamp. Co's list. 70&25%

**Silver Plated—**  
 4 months or 5% cash 30 days:  
 L. Boardman & Son. 50&12 1/2%  
 Meriden & Edwards Silver Co. 40&15 1/2%  
 Meriden Brit. Co. Rogers. 40&15 1/2%  
 Reed & Barton. 40&10&5%  
 Rogers & Bros. 40&15 1/2%  
 C. Rogers & Bros. 40&15 1/2%  
 Rogers & Hamilton. 40&15 1/2%  
 Wm. Rogers Mfg. Co. 40&15 1/2%  
 Simpson, Hall, Miller & Co. 40&15 1/2%

**Miscellaneous—**  
 Boardman's Britannia Spoons, case lots. 60&5% cash  
 Boardman's Nickel Silver, list July 1, '91. 80&7 1/2%  
 Britannia. 60&60&5%  
 German Silver. 50&50&5%  
 Nickel Silver. 50&50&10&5% cash  
 Holmes & Edwards Silver Co.  
 No. 24 German Silver. 50&10&5%  
 No. 30 Silver. 50&10&5%  
 No. 49 Nickel Silver. 50&10&5%  
 No. 50 Nickel Silver. 50&5%  
 No. 67 Mexican Silver. 50&10&5%  
 Rogers & Hamilton:  
 Clometar, Flatware. 40&15&5%  
 Clometar Steel Goods. 40&10%  
 Crown Hamilton, Flatware and Cutlery. 30%  
 Steel Goods. 40&10%  
 Wm. Rogers Mfg. Co.:  
 18% Rogers' German Silver. 60&6%  
 22% Rogers' Nickel Silver. 50&6%  
 Rogers' Silver Metal. 50&10&5%

**Springs—Door**  
 Champion (Coil). 50&10&5%  
 Cowell's, No. 1, 1/2 doz. \$18.00; No. 2, \$15.00. 50&50&10%  
 Gem (Coil), list April 19, '88. 20%  
 Hercules. 50&50&10%  
 Phoenix. 33 1/2&33 1/2%  
 Rubber, complete, 1/2 doz. \$5.50, 66 2/3%  
 Star (Coil). 50&50&10%  
 Torrey's Rod, 39 in. 1/2 doz. \$1.20, 1 1/2 doz. \$1.50, No. 2, \$3.40. 55&55&10%  
 Victor (Coil). 60&10&60&10&5%  
**Carriage, Wagon, &c.**  
 Elliptic, Concord, Platform and Half Scroll. 60&10&60&10&10% or net prices  
 Cliff's Bolster Springs. 25%

**Sprinklers, Lawn—**  
 Gibbs Arc. 1/2 doz. \$12.00  
 Gibbs Hustler. 1/2 doz. \$6.00  
**Squares—**  
 Nickel-Plated. 85&85&5%  
 Steel and Iron. 85&85&5%  
 Try Square and T Bevels. 60&10&10%  
 Avery's Bevel Protractor. 50%  
 Avery's Flush Bevel Squares. 40%  
 Disston's Try Sq. and T Bevels 50&50&10%  
 Starrett's Micrometer Caliper Sq's. 25%  
 Winterbottom's Try and Miter. 30&10%

**Squeezers—Fodder—**  
 Blair's. 1/2 doz. \$2.00  
 Blair's Climax. 1/2 doz. \$1.00  
**Lemon—**  
 Porcelain Lined, No. 1, 1/2 doz. \$6.00.  
 Wood, Common. 1/2 doz. \$1.70, 75%  
 Wood, No. 2. 1/2 doz. \$3.00, 35%  
 Dean's, No. 1, 1/2 doz. \$6.50, 2, \$8.35; 3, \$1.65; Queen, \$2.50  
 Dunlap's Improved, 1/2 doz. \$2.75, 20&10%  
 Hotchkiss Straight Flash. 1/2 doz. \$9.60  
 Jennings' Star. 1/2 doz. \$2.50  
 King. 40&5%  
 Little Giant. 50&50&5%  
 The Boss. 1/2 doz. \$2.50  
**Standard Fiber Ware—**  
 See Ware, Standard Fiber

**Staples—**  
 Barbed Blind, 1/2 in. and larger, 1/2 doz. 70&7 1/2%  
 Barbed Blind, 3/4 in. 1/2 doz. 80&8 1/2%  
 Fence Staples, Galvanized. Same price  
 Fence Staples, Plain. Same price  
 Grand Crossing Tack Co.'s list. 75&10%  
**Steels, Butchers'—**  
 C. & A. Hoffmann's. 40%  
 Nichols Bros. 50%  
**Steelyards—**  
 4 & 10&5%

**Stocks and Dies—**  
 Blacksmith's:  
 Butterfield's Goods. 35%  
 Waterford Goods. 35%  
 Gardner. 25%  
 Green River. 25&30%  
 Lightning Screw Plate. 25&30%  
 Reece's New Screw Plates. 25&30%  
 Reversible Ratchet. 35%  
**Stone**  
 Stones, Grind—See Grindstones.  
 Scythe Stones—  
 Pike Mfg. Co., list April, '92. 33 1/2%  
 Cleveland Stone Co., list Nov. '92. 33 1/2%

**Oil Stones, &c.**  
 Pike Mfg. Co.:  
 Hindostan No. 1, 1/2 doz. 8¢  
 Sand Stone. 40&40%  
 Turkey Oil Stone, 4 to 8 in. 10%  
 Turkey Slips. \$2.00  
 Lilly White Washita. 80¢  
 Rosy Red Washita. 80¢  
 Washita Stone, Extra. 50¢  
 Washita Stone, No. 1. 40¢  
 Washita Stone, No. 2. 40¢  
 Lilly White Slips. 80¢  
 Rosy Red Slips. 80¢  
 Washita Slips, Extra. 80¢  
 Washita Slips, No. 1. 70¢  
 Arkansas Stone, No. 1, 3 to 5 in. \$2.80  
 Arkansas Stone, No. 15 1/2 to 8 in. \$3.50  
 Lake Superior. 13¢  
 Lake Superior Slips. 20¢  
 Tanite Mills:  
 Emery Oil, 1/2 doz. \$9.00. 50&65%  
**Stops, Bench—**  
 Cincinnati. 25&10%  
 Crescent. 1/2 doz. \$1.50  
 Hotchkiss, 1/2 doz. \$5. 10&10&10%  
 McGills, 1/2 doz. \$3. 10%  
 Millers Falls. 25%  
 Morrill's, 1/2 doz. No. 1, \$10.00; No. 2, \$11.00, 40&20%  
 Stearns'. 20&10%  
 Terrell's Nos. 1 and 2, 1/2 doz. \$3; No. 3, \$3.60. 30%  
 Weston's No. 1, \$10; No. 2, \$9.25&10&5%  
**Stove Polish—See Polish, Stove.**  
**Stretchers, Carpet—**  
 Cast Iron, Steel Points. 1/2 doz. 75&80¢  
 Cast Steel, Polished. 1/2 doz. \$2.25  
 Socket. 1/2 doz. \$1.75  
 Bullard's. 25&10&40%

**Strops, Razor—**  
 Emerson C. Buff. 1/2 doz. \$2.80&3.00  
 Imitation Emerson. 1/2 doz. \$1.25&1.50  
 Jordan's Pat. Padded, list Nov. 1, '89, 50%  
 Lamont Combination. 1/2 doz. \$4.00  
**Stuffer, Sausage—**  
 Miles' Challenge, 1/2 doz. \$20. 50&50&5%  
 Perry. 1/2 doz. No. 1, \$15.00; No. 2, \$21.00. 50&50&10%  
 Draw Cut No. 4, each \$30.00. 20%  
 Enterprise Mfg. Co., list Jan. 17, '93. 25%  
 Silver's. 40&10%

**Sweepers, Carpet and Lawn—**  
 Carpet—  
 Acme. 1/2 doz. \$26.00  
 Advance. 1/2 doz. \$18.00  
 Grand. 1/2 doz. \$36.00  
 Gold Medal. 1/2 doz. \$27.00  
 Prize. 1/2 doz. \$27.00  
 Premier. 1/2 doz. \$27.00  
 Superior. 1/2 doz. \$27.00  
 Cosmopolitan. 1/2 doz. \$27.00  
 Furniture Protector, Jap. 1/2 doz. \$24.00  
 Furniture Protector, Nickel 1/2 doz. \$27.00  
 Furniture Ocean. 1/2 doz. \$27.00  
 Hall. 1/2 doz. \$48.00  
 Crown Jewel, No. 1, \$18.00; No. 2, \$19.00; No. 3, \$20.00  
 Domestic, No. 1. 1/2 doz. \$21.00  
 Domestic, No. 2. 1/2 doz. \$22.00  
 Easy Jap'd, 1/2 doz. \$22.00; Nickel, \$24.00  
 Eureka. 1/2 doz. \$27.00  
 Garland. 1/2 doz. \$18.00  
 Gilt Edge. 1/2 doz. \$24.00  
 Grand Rapids, Japanned. 1/2 doz. \$24.00  
 Grand Rapids, Nickle. 1/2 doz. \$27.00  
 Housewife's Delight. 1/2 doz. \$15.00  
 Improved Parlor Queen, 1/2 doz. \$24.00  
 Nickle. 1/2 doz. \$27.00  
 Ladies' Friend. 1/2 doz. \$15.00  
 Ladies' Friend No. 2. 1/2 doz. \$16.00  
 Parlor Queen. 1/2 doz. \$24.00  
 Standard. 1/2 doz. \$24.00  
 Supreme. 1/2 doz. \$22.00  
 Bissell Carpet Sweeper Co. make the following rebates:  
 \$1.00 1/2 doz. in 5-doz. lots.  
 \$2.00 1/2 doz. in 10-doz. lots.  
**Lawn—**  
 Thompson Mfg. Co. 30%  
**Swings—**  
 Davies Lawn. 25%

**Tacks, Brads, &c.—**  
 List Oct. 19, '89, Old Established straight Weights. Short Weight goods are sold at lower prices.  
 Carpet Tack. 47 1/2%  
 American, Tin'd and Cop'd. 47 1/2%  
 Steel, Bright and Blue. 47 1/2%  
 Steel, Tinned and Coppered. 52 1/2%  
 Swedes Iron, S. S., Blue. 40%  
 Swedes Iron, S. S., Tinned. 47 1/2%  
 American Iron Tacks, Domestic. 37 1/2%  
 American Iron Tacks, Foreign. 50%  
 Swedes Iron Tacks—  
 S. S., Blue. 37 1/2%  
 S. S., Tinned. 45%  
 Lanc., Blue. 30%  
 Lanc., Tinned. 37 1/2%  
 Upholsterers', S. S. 47 1/2%  
 Upholsterers', Lanc. 37 1/2%  
 Gimp Tacks—  
 S. S., Blue. 30%  
 S. S., Tinned. 42 1/2%  
 Lanc., Blue. 20%  
 Lanc., Tinned. 35%  
 Basket and Trimmers' Tacks—  
 Lanc. 20%  
 S. S. 30%  
 Hungarian Nails. 35%  
 Common and Patent Brads. 35%  
 Leathered Tacks. 5%  
 Brush Tacks and Nails, S. S. 20%  
 Looking Glass Tacks, S. S. 12 1/2%  
 Picture Frame Points, S. S. 12 1/2%  
 Lace Tacks, Blue. 12 1/2%  
 Lace Tacks, Tinned. 20%  
 Finishing Nails. 52 1/2%  
 Trunk and Clout Nails—  
 Black. 52 1/2%  
 Tinned or Coppered. 57 1/2%  
 Basket Nails. 37 1/2%  
 Chair Nails. 37 1/2%  
 Cigar Box Nails. 30%  
 Tin Capped Nails. 50%  
 Shoe Finders' List, Apr. 14, '94.  
 F. H. Cobblers' Nails:  
 4 1/2-in. and shorter, 100 lb. \$18.80  
 4 in. and longer, 100 lb. \$18.85  
 C. S. Corrugated Brass Nails, or  
 Flat Head Improved Brass Nails:  
 No. 18 and 19 17 & heavier  
 2-8 & 2 1/2-8 in. \$60.00 \$41.20  
 3-8 & 3 1/2-8 in. 51.50 35.15  
 4-8 & longer. 41.20 33.45

**Miscellaneous—**  
 Double Point. 85&10&85&10&10%  
 Wire Carpet Nails. 60&10&80&10&10%  
 Bill Nye Brad Box. \$4.00  
 Bonnie Blue. 1/2 box \$1.50  
 Claw Hand Carpet. 1/2 gr. \$4.00  
 Home Tacks, No. 50, 1/2 case (12 cartons), \$36.00; No. 100, 1/2 case (12 cartons), \$72.00.  
 Home Nails, No. 200, 1/2 case (12 cartons), \$30.00; No. 400, 1/2 case (12 cartons), \$60.00.  
 Parisian Gift Nails, cartoon. 50%  
 Plymouth Rock Carpet Tacks. 20%  
 Upholsterers' Nails. 50&10%  
**Wire Brads and Nails—**  
 Steel-Wire Brads, R. & E. Mfg. Co's list. 50&10&10%  
 See also Nails, Wire.  
**Tanks, Oil—**  
 Emerald, S. S. & Co. 30-gal. \$8.70; 60-gal., \$11 each. 50&10&5%  
**Tapes, Measuring—**  
 American. 40&10&50%  
 Chesterman's, Regular list. 30&30&5%  
 Excelsior, Special list. 20%  
 Spring. 40%

**Thermometers—**  
 Tin Case. 80&80&10%  
**Thimble Skins—**  
 See Skins.  
**Ties, Bale—Steel.**  
 Standard Wire, list. 50&10&5%  
**Tinner's Shears, &c.—**  
 See Shears, Tinner's, &c.  
**Tinware**  
 Stamped, Japanned and Piced, list Jan. 20, '87. 70&10&70&25%  
**Tire Benders, Upsetters, &c.—See Benders and Upsetters, Tire.**  
**Tobacco Cutters—**  
 See Cutters, Tobacco.  
**Tools—Coopers'—**  
 Albertson Mfg. Co. 25%  
 Barton's. 20&20&5%  
 Beatty's. 33 1/2%  
 Bradley's. 20%  
 Sandusky Tool Co. 30&30&5%  
 Shaves, Cincinnati Tool Co. 20%  
 L. & I. J. White. 20&5%

**Lumber—**  
 Cant Hooks, "Blue Line". 1/2 doz. \$16.00  
 Cant Hooks, Common Finish. 1/2 doz. \$11.00  
 Cant Hooks, Mail, Socket Clasp, "Blue Line" Finish. 1/2 doz. \$16.00  
 Cant Hooks, Mail, Socket Clasp, Common Finish. 1/2 doz. \$14.50  
 Cant Hooks, Clip Clasp, "Blue Line" Finish. 1/2 doz. \$14.00  
 Cant Hooks, Clip Clasp, Common Finish. 1/2 doz. \$12.00  
 Hand Spikes. 1/2 doz. 6 ft., \$15.00; 8 ft., \$20.00  
 Pike Poles, Pike and Hook, 1/2 doz., 12 ft., \$11.50; 14 ft., \$12.50; 16 ft., \$14.50; 18 ft., \$17.50; 20 ft., \$21.50.  
 Pike Poles, Pike only, 1/2 doz. 12 ft., \$10.00; 14 ft., \$11.00; 16 ft., \$13.00; 18 ft., \$16.00; 20 ft., \$20.00.  
 Pike Poles, not ironed, 1/2 doz., 12 ft., \$8.00; 14 ft., \$7.00; 16 ft., \$9.00; 18 ft., \$12.00; 20 ft., \$16.00.  
 Mail, Iron Socket Peavies. 1/2 doz. \$19.00  
 Ring Peavies, "Blue Line". 1/2 doz. \$20.00  
 Ring Peavies, Common. 1/2 doz. \$18.00  
 Steel Socket Peavies. 1/2 doz. \$21.00  
 Setting Poles, 1/2 doz. 12 ft., \$14.00; 14 ft., \$15.00; 16 ft., \$17.00.  
 Swamp Hooks. 1/2 doz. \$18.00  
 Champion Steel Socket Peavies—  
 Maple Handles, 2 1/2 in. x 4 1/2 in. to 6 ft. 24.00  
 Maple Handles, 2 1/2 in. x 4 1/2 in. to 6 ft. 26.50  
 Maple Hndls, 3 in. x 4 1/2 in. to 6 ft. 29.00  
 Champion Solid or Split Socket Peavies—  
 Maple Handles, 2 1/2 in. x 4 1/2 in. to 6 ft. \$21.00  
 Maple Handles, 2 1/2 in. x 4 1/2 in. to 6 ft. 23.50  
 Maple Hndls, 3 in. x 4 1/2 in. to 6 ft. 26.00  
 Champion Cast Iron Hooks, with steel clasp. 45%  
 Maple Handles, 2 1/2 in. x 4 1/2 in. to 5 ft. \$20.00  
 Maple Handles, 2 1/2 in. x 4 1/2 in. to 5 ft. 21.50  
 Maple Handles, 3 in. x 4 1/2 in. to 5 ft. 23.50  
 Champion Cast Iron Hooks, with malleable clasp. 45%  
 Maple Handles, 2 1/2 in. x 4 1/2 in. to 5 ft. 17.50  
 Maple Handles, 2 1/2 in. x 4 1/2 in. to 5 ft. 19.50  
 Chamolun Lug Hooks. 28.00  
 Champion Skedding Tongs. 72.00  
 Champion Swamp Hooks. 22.00  
 Champion Pike Poles, ironed complete, 12 to 20 ft. 5%  
 Cant Hook and Peavy Handles. 45%

**Saw—**  
 Atkins', new list. 40%  
 Simonds'. 33 1/2%  
**Transom Lifters—**  
 See Lifters, Transom.  
**Traps—Game—**  
 Blake's Patent. 50&10&60%  
 Newhouse. 40&10&50&5%  
 Onelda Pattern. 75&75&10&5%  
 Sensible. 33 1/2%  
**Mouse and Rat—**  
 Cyclone. 1/2 gr. \$5.25&5.75  
 Dandy. 1/2 doz. \$1.75  
 French Traps (Genuine), No. 1, Rat, 1/2 doz. \$15.00; No. 3, Rat, \$7.25; No. 4, Mouse, \$4.75; No. 5, Mouse. \$8.75  
 Hotchkiss Metallic Mouse, 5-hole traps, 1/2 doz. 65¢; in full case, 1/2 doz. \$1.50  
 Hotchkiss Imp. Rat Killer. 1/2 gr. \$12.50  
 Hotchkiss New Rat Killer. 1/2 gr. \$12.50  
 Ideal. 1/2 gr. \$9.00  
 Mouse, Bonanza. 1/2 doz. \$0.90&1.00  
 Mouse, Cage, Wire. 1/2 doz. \$2.50  
 Mouse, Catch-'em-alive, 1/2 doz. \$2.50. 15%

Mouse, Wood, Choker, 1/2 doz. holes 9@10¢  
 Mouse, Round Wire, 1/2 doz. \$1.50. 10%  
 Mouse, Sensible. 33 1/2%  
 Rat, Decoy, 1/2 gr. \$10.00. 10%  
 Rat, Sensible. 33 1/2%  
 Schuyler's Rat Killer. 1/2 gr. \$15.00  
 Waddell's Go Bang. 1/2 gr. \$12.50  
**Fly—**  
 Balloon, Globe or Acme. 1/2 doz. \$1.50; 1/2 gr. \$13.50  
 Harper, Champion or Paragon. 1/2 doz. \$1.75; 1/2 gr. \$16.50

**Triers—**  
 Butter and Cheese. 25%  
**Trimmers, Spoke—**  
 Bonney's No. 1, 1/2 doz. \$5.00; No. 2, \$7.00. 40&40&10%  
 Ives', No. 1, \$15.00; No. 2, \$12.00. 1/2 doz. 55&10%  
 Stearns'. 20&10%  
 Douglas', 1/2 doz. \$9.00. 20%  
 Cincinnati. 25&10%

**Trowels—**  
 Brade's Brick. 25&25&5%  
 Maynard's. 25&10%  
 Disston's Brk and Plastering. 25&25&10%  
 William Johnson. 25&10%  
 Peace's Plastering. 25&25&5%  
 Rose's Brick. 25&30%  
 Worrall's Brick and Plastering. 20%  
 Cleves' Angle Trowel, 1/2 gr., No. 1, \$36.00; No. 2, \$30.00; No. 3, \$15.00. net @ 10%  
 Garden. 70%

**Trucks, Warehouse, &c.—**  
 B. & L. Block Co.'s list. 40%  
 Barnes' Barrel Trucks. 40%  
 Daisy Stove Trucks, Improved pattern. 1/2 doz. \$18.00  
 Thompson Mfg. Co. 40%

**Tubes, Boiler—**  
 See Pipe.  
**Twine—**  
 Flax Twine—  
 No. 9, 1/2 and 1/2 lb Balls. 22 1/2 26¢  
 No. 12, 1/2 and 1/2 lb Balls. 18 24¢  
 No. 18, 1/2 and 1/2 lb Balls. 17 20¢  
 No. 24, 1/2 and 1/2 lb Balls. 17 20¢  
 No. 36, 1/2 and 1/2 lb Balls. 16 10¢  
 Chalk Line, Cotton, 1/2 lb Balls. 17¢  
 Cotton Mops, 6, 9, 12 and 15 lb to doz. 15&17¢  
 Cotton Wrapping, 5 Balls to lb. 13&14¢  
 2-Ply Hemp, 1/2 and 1/2 lb Balls (Spring Twine). 10&10 1/2¢  
 3-Ply Hemp, 1 lb Balls. 10&10 1/2¢  
 3-Ply Hemp, 1 1/2 lb Balls. 10 1/2¢  
 2, 3, 4 and 5-Ply Jute, 1/2 lb Balls. 8¢  
 Mason Line Linen, 1/2 lb Balls. 54¢  
 No. 204 Mattress, 1/2 and 1/2 lb Balls. 52&54¢  
 Paper. 10&11¢  
 Wool. 5 1/2¢@6¢

**Vises—**  
 Solid Box. 50&10¢@60¢  
**Parallel—**  
 Backus and Union. 40%  
 Bonney's. 45&50%  
 Double Screw Loe. 45&50%  
 Fisher & Norris Double Screw. 15&10%  
 Hollands'. 40&40&10%  
 Howard's. 40%  
 Massey Quick Action. 20&25%  
 Merrills'. 15&20%  
 Millers Falls. 40&40&10%  
 Moore's. 20%  
 Parker's. 20&25%  
 Prentiss. 20&25%  
 Sargent's. 70&10&70&10&10%  
 Simpson's Adjustable. 40%  
 Stephens'. 25&30%  
 Trenton. 40&5&40&10%

**Saw Files—**  
 Bonney's, Nos. 2 & 3, \$15.00. 45&50%  
 Cincinnati. 25&10%  
 Economy, 1/2 doz., Nos. 110, \$10.00. 20, \$15.00. 50&10&10&5%  
 Hopkins', 1/2 doz. \$17.50. 10%  
 Reading. 40&10%  
 Stearns' Common, Nos. 0, 1, 2 & 3. 50%  
 Stearns' Rubber Jaw, Nos. 10 & 33. 33 1/2%  
 Wentworth. 20&10%

**Miscellaneous—**  
 Bauer's Pipe Vises. 10%  
 Cowell Hand Vises. 20%  
 Enterprise Pipe Vises, each \$3.00. 40%  
 Massey Combination Pipe Vise. 40%  
 Phoenix Vises. 33 1/2%  
 Phoenix Hand Vises, 1/2 doz. \$3.60. 33 1/2%

**Wads.—Price Per M.**  
 U. M. C. & W. R. A.—B. E. 11 up. 60¢  
 U. M. C. & W. R. A.—B. E. 9 & 10. 70¢  
 U. M. C. & W. R. A.—B. E. 8. 80¢  
 U. M. C. & W. R. A.—B. E. 7. 80¢  
 U. M. C. & W. R. A.—P. E. 11 up. \$1.00  
 U. M. C. & W. R. A.—P. E. 9 & 10. 85¢  
 U. M. C. & W. R. A.—P. E. 8. 1.50  
 U. M. C. & W. R. A.—P. E. 7. 1.50  
 Eley's B. E., 11 and larger. \$1.70@1.75  
 Eley's P. E., 12 to 20. \$3.00@3.25

**Wagon Boxes—**  
 See Boxes, Wagon.  
**Wagon Jacks—**  
 See Jacks, Wagon.  
**Ware, Hollow—**  
 Cast Iron, Hollow—  
 Stove Hollow-Ware—  
 Ground. 60&10&10@70%  
 Unground. 70&5@75%  
 Gray Enamelled Ware—  
 Stove. 50&50&5%  
 Maslin Kettles. 60&10&60&10&10%  
 Boilers and Saucepans. 40&5&40&10%  
 White Enamelled Ware—  
 Maslin Kettles. 70&10&75&5%  
 Boilers and Saucepans. 60&10&10%  
 Rustless Hollow Ware. 50&50&10%  
 Tinned Boilers and S'pans. 60&60&10%

**Enamelled—**  
 Agate and Granite Ware, list Jan. 1, '94. 25&25&10%  
 Ironclad Enamelled Ware, Old list. 80%  
**Kettles—**  
 Galvanized Tea-Kettles—  
 Inch. 6 7 8 9  
 Each. 55¢ 60¢ 65¢ 75¢  
**Steel Hollow Ware.**  
 Avery Spiders and Griddles 60, 10&5@70%  
 Avery Kettles. 60&10&10&70&10%

Extra 33 1/2% & 2% cash.

Extra 33 1/2% & 2% cash.

Extra 33 1/2% & 2% cash.

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